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MOPANI WEST DISTRICT
LITERACY

MATHEMATICAL

LAST PUSH ACTIVITIES 2022

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QUESTION 1 [FINANCE]

LEVEL 1-2 QUESTIONS{2.1.1 , 2.1.2 , 2.1.3 , 2.3.1 , 2.3.2}

Activity 1

- 2.1 The cost price of a CASIO and a SHARP calculator was advertised by a local store on its website on 13/2/2022 as shown below.

# PRICES ON CALCULATORS REDUCED. MAKE A SAVING!	
Brand: Casio Calculator	Brand: Sharp Scientific Calculator El-531
 SAVE Was R300,00 Save R101,00 R199,00	 SAVE Was R190,00 Save R40,00 R150,00
Sale offers valid from 14/2/2022–28/2/2022	
[Adapted from game.co.za/feb2022]	

Use the above advertisement to answer the questions that follow.

- 2.1.1 Determine for the Sharp calculator the ratio of the saving amount to the original price in the form of 1 : ... (2)
- 2.1.2 Express as a percentage (up to two decimal places) the discount amount on the price of the Casio calculator. (2)
- 2.1.3 Grade 12 learners from Tusso High School bought 8 Casio and 12 Sharp calculators on 28th February 2022. Calculate the total saving on the purchase. (3)
- 2.2 The current Grade 10 learners at Tusso High School plan to have a matric farewell in 2024. They budgeted that they would use R5 500.
- They fundraised R4 500 which they invested in a saving scheme that gives an interest of 9,5% per annum compounded annually.
- Verify, showing ALL calculations whether the class's invested amount after a period of exactly 2 years will meet their budget. (5)

2.3

Ms Nande is a 53-year-old and earned a gross income of R39 486 per month during the 2021/2022 tax year.

A non-taxable monthly deduction of 7,5% was made from her salary and paid into her pension fund.

TABLE 4 below shows the tax table for the 2022 tax year ended 28 February 2022.

TABLE 4: TAX RATES FOR 2021/2022 TAX YEAR (1 Mar. 2021–28 Feb. 2022)

TAX BRACKET	TAXABLE INCOME (R)	RATES OF TAX (R)
1	1 – 216 200	18% of taxable income
2	216 201 – 337 800	38 916 + 26% of taxable income above 216 200
3	337 801 – 467 500	70 532 + 31% of taxable income above 337 800
4	467 501 – 613 600	110 739 + 36% of taxable income above 467 500
5	613 601 – 782 200	163 335 + 39% of taxable income above 613 600
6	782 201 – 1 656 600	229 089 + 41% of taxable income above 782 200
7	1 656 601 and above	587 593 + 45% of taxable income above 1 656 600

[Adapted from www.sars.gov.za]

TABLE 5 below shows the tax rebates for the 2021/2022 tax year.

TABLE 5: TAX REBATES FOR THE 2021/2022 TAX YEAR

TAX REBATE	
Primary	R15 714
Secondary (65 and older)	R8 613
Tertiary (75 and older)	R2 871

[Adapted from www.sars.gov.za]

Use TABLE 4 and TABLE 5 above to answer the questions that follow.

2.3.1 Explain the term 'gross income' in this context. (2)

2.3.2 Show by calculation that a person who was 75 years and older, and earned R151 100 during the 2022 tax year, paid no tax. (5)

2.3.3 Calculate Ms Nande's annual tax payable. (8)

[27]

Activity 2

LEVEL 1-2 QUESTIONS{2.1.1 , 2.1.2 , 2.1.5 , 2.2.1 , 2.2.2 , 2.3.1 , 2.3.2}

ANNEXURE A

QUESTION 2.1

TABLE 2: INCOME OF DOMESTIC WORKERS

Income	Domestic worker 1	Domestic worker 2	Domestic worker 3
Number of days worked	21	15	15
Number of hours worked per day	8	8	5
Income	R2 520	R1 800	R1 125

TABLE 3: EXPENDITURES OF DOMESTIC WORKERS

	Domestic worker 1		Domestic worker 2		Domestic worker 3	
Household expenses		% of income		% of income		% of income
Transport to work (return trip)	R1 092,00	43,3%	R780,00	43,3%	R780,00	69,3%
Prepaid electricity (350kWh)	R529,34	21,0%	A	29,4%	R529,34	47,1%
Total for transport + electricity	R1 621,34	64,3%	R1 309,34	72,7%	R1 309,34	116,4%
Money remaining for other expenses	R898,66		R490,66		B	
Food for 4 people	R2 473,75		R2 473,75		R2 473,75	
Surplus/deficit	-R1 575,09	-63,7%	-R1 983,09	-80,2%	-R2 658,09	-107,5%

[Source: businessstech.co.za]

- 2.1 South Africans employ just over one million domestic workers across the country. In 2019 the National Minimum Wage was introduced, which stated that domestic workers must be paid at least a minimum of R15,00 an hour.

Tables 2 and 3 on ANNEXURE A, illustrate the scenario for one month, for three domestic workers, after the introduction of the National Minimum Wage.

Use TABLES 2 and 3 on ANNEXURE A and the above information to answer the questions that follow.

- 2.1.1 Explain the meaning of the term *income* in this context. (2)
- 2.1.2 State whether the domestic workers have a surplus or a deficit. (2)
- 2.1.3 Calculate the missing values **A** and **B**. (3)
- 2.1.4 Show with calculations that Domestic worker 1 budgets 77% more for food than electricity. (5)
- 2.1.5 Determine the probability (as a common fraction) of not selecting a domestic worker who worked more than 20 days. (2)
- 2.1.6 Provide TWO possible reasons why all the workers spend the same amount on food. (4)
- 2.1.7 Domestic worker 2 claimed that if the National Minimum Wage can increase to R27,00 per hour, there can be money left after paying all the expenses. (5)
- Verify, showing all calculations, whether the claim is valid.

- 2.2 During a particular month, Domestic worker 1's employer, Debbie, used 25 kℓ of water.

TABLE 4 shows the residential water tariffs, including VAT.

TABLE 4: RESIDENTIAL WATER TARIFFS INCLUDING VAT

Block	Tariff in kilolitres (kℓ)	Tariff in Rands per kilolitre (kℓ)
Block 1	0–6 kℓ	R10,34
Block 2	7–15 kℓ	R24,54
Block 3	16–30 kℓ	R27,63
Block 4	31–60 kℓ	R33,10
Block 5	61 or more kℓ	R38,91

[Source: Mangaung.co.za]

Use TABLE 4 and the information above to answer the questions that follow.

- 2.2.1 What does the acronym *VAT* stand for? (2)
- 2.2.2 Determine the maximum number of kℓ that can be charged in Block 2. (2)
- 2.2.3 Calculate the amount that Debbie will pay for the water used. (5)

2.3

Debbie wants to buy a water purifying system for her drinking water. The following options are available for her.

PAYMENT OPTIONS	PICTURE OF A WATER PURIFYING SYSTEM
Option 1: The cash price is R2 299 Option 2: • R216 per month • The amount includes insurance and service fee • 24 months to pay • Interest 17,25% p.a. Option 3: • R211 per month • Amount excludes insurance and service fee • 12 months • Interest 17,5% p.a.	 The image shows a Reverse Osmosis System. It consists of a horizontal unit with three vertical filters (labeled 'PP-10', 'AC-10', and 'PP-10') and a large white storage tank on the right. The unit is labeled 'Reverse Osmosis System'.

[Source: www.takealot.com]

Use the information above to answer the questions that follow.

2.3.1 Write the acronym *p.a.* in full. (2)

2.3.2 Calculate the amount of interest p.a. charged in option 3. (3)

2.3.3 Debbie told her domestic worker that she would pay more than double the cash price if she chose to buy using option 2.

Verify, showing all calculations, if Debbie's statement is correct. (5)

[42]

Activity 3

LEVEL 1-2 QUESTIONS{2.1.1 , 2.1.2 , 2.1.3 , 2.1.4a , 2.2.2 , 2.3.1}

- 2.1 Mr. Nkosi intends to buy his first house for R1 450 000. He approached two financial institutions to compare loan amounts between the two. Refer to Table 2 below and answer the questions that follow.

Table 2: Bond options for Mr Nkosi (first time home loan)

ITEM	INVESTEC	FNB
Loan amount	B	R1 520 172
*Initiation fee	R6 037,50	0
*Bond registration fee	R29 280,00	R27 211,00
*Bond transfer fee	R20 432,50	R42 961,00
Total set up costs	A	R70 172,00
Monthly repayments	R11 489,79	R11 577,17
Monthly service fees	R69,00	R69,00
	Not applicable if loan is paid from personal account	
Term agreement	20 years	240 months

- 2.1.1 The bank recommends that your bond monthly repayment not exceed 30% of your gross monthly salary. What will Mr. Nkosi's gross salary have to be to get a loan from Investec? Round-off your answer to the nearest ten thousand. (4)
- 2.1.2 Determine the total set-up costs, **A**, for the Investec option. (2)
- 2.1.3 When buying a property, you may add all the set-up costs to the purchase price of the house to get the loan amount. Determine **B**, the loan amount for Investec, if the house is listed for R1 450 000. (2)
- 2.1.4 The service fee of R69,00 is not charged by Investec to Mr. Nkosi if his loan is paid from his personal account.
- (a) How much money will he save at Investec over the total period of the loan? (3)
- (b) If Mr. Nkosi does not pay his loan from his personal account, how would this impact him financially? (2)
- 2.1.5 Mr. Nkosi states that if he buys his house through Investec and pays from his personal account, he will save money on interest and monthly service fees by the time the loan is paid in full. Determine, showing ALL calculations, how much Mr. Nkosi will save if he chooses the Investec option. (9)

- 2.2 The value of a currency fluctuates on a daily basis based on supply and demand. Refer to the table below and answer the questions that follow.

Table 3: Currency and rand value

Currency	Rand Value
US Dollar	R13,82
Canadian Dollar	R10,35
British Pound	R18,06
Euro	R15,73
Australian Dollar	R9,82

- 2.2.1 (a) Which currency, from the table above, is the weakest? (2)
 (b) Explain what this would mean to a South African travelling overseas. (2)
- 2.2.2 Mrs Nkosi receives £1 200 from her aunt in Britain. Use the table above to calculate the rand value of £1 200. (2)
- 2.2.3 After Mrs Nkosi exchanged the money, she was charged R200,80. Exchanging money in South Africa consists of an administration fee of R125 and a commission fee of 2,28% of the amount exchanged. Verify, showing all calculations, whether she was charged the correct amount. (4)
- 2.2.4 Exchange rates fluctuate all the time. List ONE reason why this happens. (2)
- 2.3 Electricity can be purchased from Eskom in two ways, prepaid and postpaid. Refer to the comparative table below to answer the questions that follow.

Table 4: Fixed monthly cost against cost per unit

System name	Fixed monthly cost	Cost per unit (R/kWh)	
Prepaid	R200,00	R0,7085	
Post-Paid	nil	0 – 50	R0,69
		50,1 – 350	R0,81
		350,1 – 600	R1,27
Prices exclude VAT of 15%			

- 2.3.1 Write down the fixed monthly cost for the prepaid system. (2)
- 2.3.2 The Smith's household, consisting of 3 people, used 349,9 kWh of electricity on the post-paid system. How much would they be expected to pay (excluding VAT) for their electricity consumption? (4)
- 2.3.3 Mrs Smith worked out that when her daughter goes to university her bill will be two-thirds of the amount calculated in QUESTION 2.3.2. Verify, showing all calculations, if her assumption is correct. (6)

Activity 4

LEVEL 1-2 QUESTIONS{2.1.1 , 2.1.4 , 2.2.1 , 2.2.2 , 2.2.3 , 2.3.1a}

- 2.1 Umlalazi Municipality published the financial statements for 2020 and 2021 for the different votes or departments labelled Vote 1 to Vote 13 as shown in TABLE 1 below.

TABLE 1: FINANCIAL PERFORMANCE OF DEPARTMENTS/VOTES

VOTE	2020		2021	
	REVENUE R thousands	EXPENDITURE R thousands	REVENUE R thousands	EXPENDITURE R thousands
Vote 1	204 409	78 556	156 335	28 211
Vote 2	66 587	50 753	47 441	27 564
Vote 3	-	2 595	-	1 236
Vote 4	5 290	17 659	151	9 310
Vote 5	26	16 982	20	9 515
Vote 6	3	11 932	2	6 120
Vote 7	37 687	39 052	37 830	38 515
Vote 8	2 765	12 125	1 685	8 013
Vote 9	39 666	101 502	15 866	51 716
Vote 10	15 532	27 294	8 207	13 299
Vote 11	78 899	81 680	37 022	38 481
Vote 12	-	4	-	0
Vote 13	-	365	-	259
TOTAL	450 864	-		
SURPLUS/DEFICIT	10 365		C	

[Adapted from www.umlalazi.gov.za]

Study TABLE 1 above and answer the questions that follow.

- 2.1.1 Explain the term “surplus” in this context. (2)
- 2.1.2 Show how the 2020 surplus of R10 365 was calculated. (3)
- 2.1.3 One councillor stated that the percentage difference in the expenditure for Vote 13 from 2020 to 2021, was greater than -29%. Use calculations to verify the statement.

You may use the formula: (4)

$$\% \text{ difference} = \frac{\text{2021 expenditure} - \text{2020 expenditure}}{\text{2020 expenditure}} \times 100\%$$

- 2.1.4 If a vote is picked at random, what is the probability that its expenditure for 2021 is greater than R27 000 000? Write your answer as a percentage. (3)

- 2.2 Dream Big High School received an electricity account statement for the school from uMlalazi Municipality. ANNEXURE A is an extract of the account statement with some values and amounts left out.

Use ANNEXURE A to answer the following questions.

- 2.2.1 Explain the term “*opening balance*” in this context. (2)
- 2.2.2 Show, using the meter readings that the value of **D** is 15 012. (2)
- 2.2.3 Calculate the missing value **E**. (2)
- 2.2.4 Use calculations to verify if the VAT amount of R4 374,81 was calculated correctly. (4)

- 2.3 Mr Mdletshe is 68-year-old businessman, married with three grand children who are also covered by his medical aid. As a company director, Mdletshe earns a monthly income of R42 000 and donates R2 500 every month to a local Orphanage. TABLE 2 below shows Individual Income Tax Rates for 2022.

N.B: Donations by natural persons not exceeding R100 000 are allowable tax deductions.

TABLE 2: INDIVIDUAL INCOME TAX RATES – 2022

Taxable income (R)	Rates of tax (R)
1 – 226 000	18% of taxable income
226 001 – 353 100	40 680 + 26% of taxable income above 226 000
353 101 – 488 700	73 726 + 31% of taxable income above 353 100
488 701 – 641 400	115 762 + 36% of taxable income above 488 700
641 401 – 817 600	170 734 + 39% of taxable income above 641 400
817 601 – 1 731 600	239 452 + 41% of taxable income above 817 600
1 731 601 and above	614 192 + 45% of taxable income above 1 731 600
Rebates	
Primary Rebate (Persons under 65)	R15 714
Secondary Rebate (Persons 65 and under 75)	R24 327
Tertiary Rebate (Persons 75 and over)	R27 198
Medical Aid Tax Credits	
Main member	R332
First dependant	R332
For each additional dependant	R224

[Adapted from www.sars.gov.za]

Use TABLE 2 and the information above to answer the questions that follow.

- 2.3.1 Calculate:

- (a) Mdletshe’s annual taxable income. (3)
- (b) annual medical tax credits. (4)

- 2.3.2 Mr Mdletshe claims that his tax is not more than R4 500. Verify his claim. (9)

[38]

Activity 5

LEVEL 1-2 QUESTIONS{2.1.1 , 2.1.2 , 2.1.3 , 2.2.1 , 2.2.2}

- 2.1 Mr Charlie Rawson took his car for the 120 000 km service at Hudson Motors. ANNEXURE A shows the invoice for the service.

Use the information above and ANNEXURE A to answer the questions that follow.

- 2.1.1 Express the cost of filter C as a percentage of the total cost of the parts. (3)
- 2.1.2 Show how the sub total amount of R4 986,60 was calculated. (2)
- 2.1.3 Calculate A, the VAT amount for this invoice. (3)
- 2.1.4 Mr Rawson paid R4 790 for the previous service. He claims that the total service cost on this invoice will be 20% more than the previous cost.
- Verify, by showing ALL calculations, if his claim is valid. (5)
- 2.1.5 The total cost of labour on the invoice depends on the duration of the service.
- Calculate the hourly labour rate for the service on Mr Rawson's car. (5)

- 2.2 Daniel wants to buy an iPhone 13 Pro. He decided to buy the phone on the internet. He got some prices from the apple.com website.

	The price of an iPhone 13 Pro in different countries: Cost in Euro = €1 576 (France) Cost in United Arab Emirates Dirham = AED 4 199 (Dubai) Cost in Indian rupee = Rp 119 900 (India)
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Daniel used the following exchange rates for his calculations:

TABLE 4: CURRENCY EXCHANGE RATE TABLE FOR 14/05/2022

Foreign currency	South African rand
1€ (Euro)	R16,833225
Rp 1 (Indian rupee)	R0,208643
1 AED (United Arab Emirates Dirham)	R4,402465

[Adapted from www.x-rates.com]

Use TABLE 4 and the information above to answer the questions that follow.

- 2.2.1 Determine the weakest currency according to the table. (2)
- 2.2.2 Define exchange rate. (2)
- 2.2.3 Daniel stated that the phone from India will be the cheapest.
- Verify, showing ALL the calculations, whether Daniel's statement is correct. (7)

[29]

QUESTION 2 [DATA HANDLING]

Activity 1

LEVEL 1-2 QUESTIONS{3.1.1 , 3.1.2 , 3.1.3 , 3.2.1 , 3.2.2}

3.1

In South Africa many people are suffering from chronic health conditions.

Population estimation in thousands ('000) in 2020 mid-year for the people with chronic health conditions is given in a table on ANNEXURE B.

NOTE: Chronic health condition(s) require one to have ongoing medical attention or take medicine on a daily or regular period as per a medical doctor's prescription.

Use the information above and ANNEXURE B to answer the questions that follow.

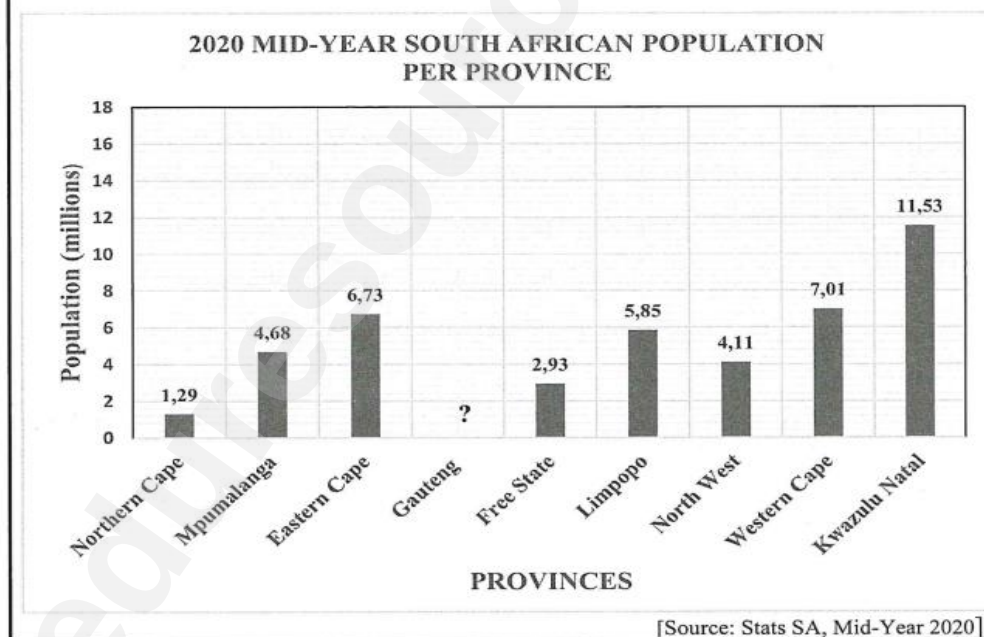
- 3.1.1 Calculate the total number of males with chronic health conditions in KwaZulu-Natal. (2)
- 3.1.2 Use the number of diabetic people to determine the provincial range among provinces in South Africa. (3)
- 3.1.3 Calculate the provincial mean number of people with hypertension (HBP) in South Africa. (3)
- 3.1.4 Determine the median of the total chronic health condition of various provinces in the RSA. (3)
- 3.1.5 Use the ANSWER SHEET to draw a line graph representing the total number of people suffering from diabetes from all provinces. (4)
- 3.1.6 Determine probability (as a percentage) of randomly selecting a diabetic female among chronic health suffering people in KwaZulu-Natal. (4)

ANNEXURE B: QUESTION 3.1

POPULATION ESTIMATION IN THOUSANDS ('000) IN 2020 MID-YEAR FOR THE PEOPLE LIVING WITH CRONIC HEALTH CONDITIONS IN THE REPUBLIC OF SOUTH AFRICA (RSA)										
PROVINCES										
Chronic health condition	Gender	Western Cape (WC)	Eastern cape (EC)	Northern Cape (NC)	Free State (FS)	KwaZulu Natal (KZN)	North West (NW)	Gauteng (GP)	Mpumalanga (MP)	Limpopo (LP)
Asthma	Male	74	75	11	14	69	23	112	40	13
	Female	112	91	15	16	101	33	157	44	25
	Total	186	166	26	30	170	56	269	84	38
Diabetes	Male	143	69	12	34	99	36	128	30	37
	Female	171	155	22	53	264	55	207	64	54
	Total	314	224	34	87	363	91	335	94	91
Hypertension (High Blood Pressure = HBP)	Male	306	151	51	99	214	141	477	103	76
	Female	419	446	91	217	543	259	722	219	201
	Total	725	597	143	316	757	400	1 199	322	277

[Source: Statssa – Mid-Year 2020]

- 3.2 The population of the Republic of South Africa during the mid-year of 2020 was estimated at 59,62 million. The graph below represents the population per province.



Use the information provided and the graph above to answer the questions that follow.

- 3.2.1 State the type of graph used to display the information. (2)
- 3.2.2 Determine the population of Gauteng and write final answer in words. (4)
- 3.2.3 Calculate the interquartile range (IQR) for the provincial populations for 2020 mid-year:

You may use the formula: $IQR = Q_3 - Q_1$

(5)
[30]

Activity 2

LEVEL 1-2 QUESTIONS{3.1.1 , 3.1.2 , 3.1.3 , 3.1.4 , 3.1.6 , 3.2.1 , 3.2.2 , 3.2.3}

- 3.1 Agriculture plays a crucial role in food security by supplying the basic food products to keep millions of people fed every day. In South Africa, the industry produces various products, from beef and poultry to maize, fruits, and vegetables.

TABLE 5 on ANNEXURE B shows the commercial farming land per province in South Africa in 2017.

Use TABLE 5 on ANNEXURE B to answer the questions that follow.

- 3.1.1 State why the data for the farming land is regarded as continuous. (2)
- 3.1.2 Write down the province with the largest grazing land. (2)
- 3.1.3 The mean number of farmworkers in South Africa in 2017 was 84 180,33. Hence determine **A**, the number of farmworkers in the Free State in 2017. (4)
- 3.1.4 Calculate the value of **B**. (3)
- 3.1.5 A farmer stated that in Western Cape, there are 27 farmworkers for every farm and that in Gauteng, there are 16 farm workers for every farm. Determine, using unit ratios, whether the statement is correct. (6)
- 3.1.6 Determine the range of the arable land. (3)

ANNEXURE B

QUESTION 3.1

TABLE 5: COMMERCIAL FARMING LAND IN HECTARES AND PERCENTAGE PER PROVINCE IN 2017

Province	Number of farms	Number of farm workers	Total Farming land		Grazing land		Arable land		Other land	
			Hectares	%	Hectares	%	Hectares	%	Hectares	%
Western Cape	6 937	186 997	4 098 779	8,8	2 738 371	7,5	1 003 642	13,2	356 765	15,7
Eastern Cape	4 214	65 151	5 713 528	12,3	5 266 438	14,4	357 810	4,7	89 278	3,9
Northern Cape	4 829	69 070	17 229 260	37,1	16 358 215	44,8	671 400	8,8	199 643	8,8
Free State	7 951	A	7 636 020	16,4	5 161 833	14,1	2 454 122	32,2	20 062	0,9
KwaZulu-Natal	3 103	96 206	1 843 926	4,0	917 312	2,5	524 053	6,9	402 559	B
Northwest	4 920	57 758	5 323 682	11,5	3 474 878	9,5	1 118 509	14,7	730 294	32,2
Gauteng	2 291	36 517	385 317	0,8	197 878	0,5	180 349	2,4	7 088	0,3
Mpumalanga	2 823	73 318	2 467 007	5,3	1 177 535	3,2	943 163	12,4	346 307	15,3
Limpopo	3 054	97 478	1 722 938	3,7	1 244 477	3,4	361 341	4,7	117 119	5,2
South Africa	40 122	...	46 420 458	100	36 536 940	100	7 614 392	100	2 269 115	100

[Source: www.statista.com]

NOTE: **Grazing land** is used for livestock and game farming, and **Arable land** is used for crop production.

- 3.2 The pie chart on ANNEXURE C shows the types and percentages of the livestock population (in %) in South Africa in November 2019.

Use the information on ANNEXURE C to answer the questions that follow.

- 3.2.1 Calculate the actual number of the buffalo population. (4)
- 3.2.2 Give an example of livestock that can be classified as OTHER. (2)
- 3.2.3 Determine the probability (as a decimal) of randomly selecting beef cattle from the percentage cattle livestock population. (3)
- 3.2.4 There was an increase of 15,7% in the total livestock population between November 2019 and November 2020.

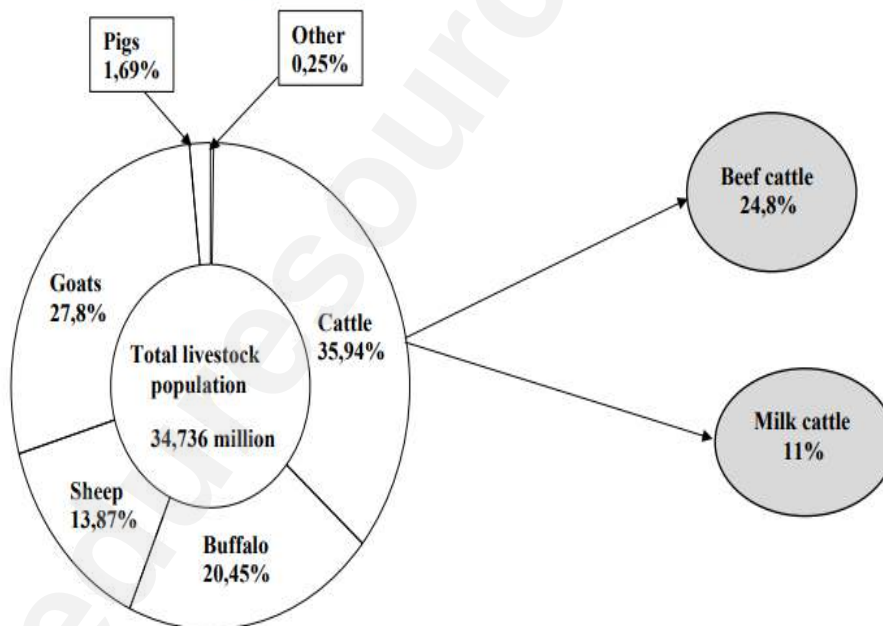
Calculate the total livestock population in November 2020. (3)

[32]

ANNEXURE C

QUESTION 3.2

LIVESTOCK POPULATION (IN %) IN SOUTH AFRICA IN NOVEMBER 2019.



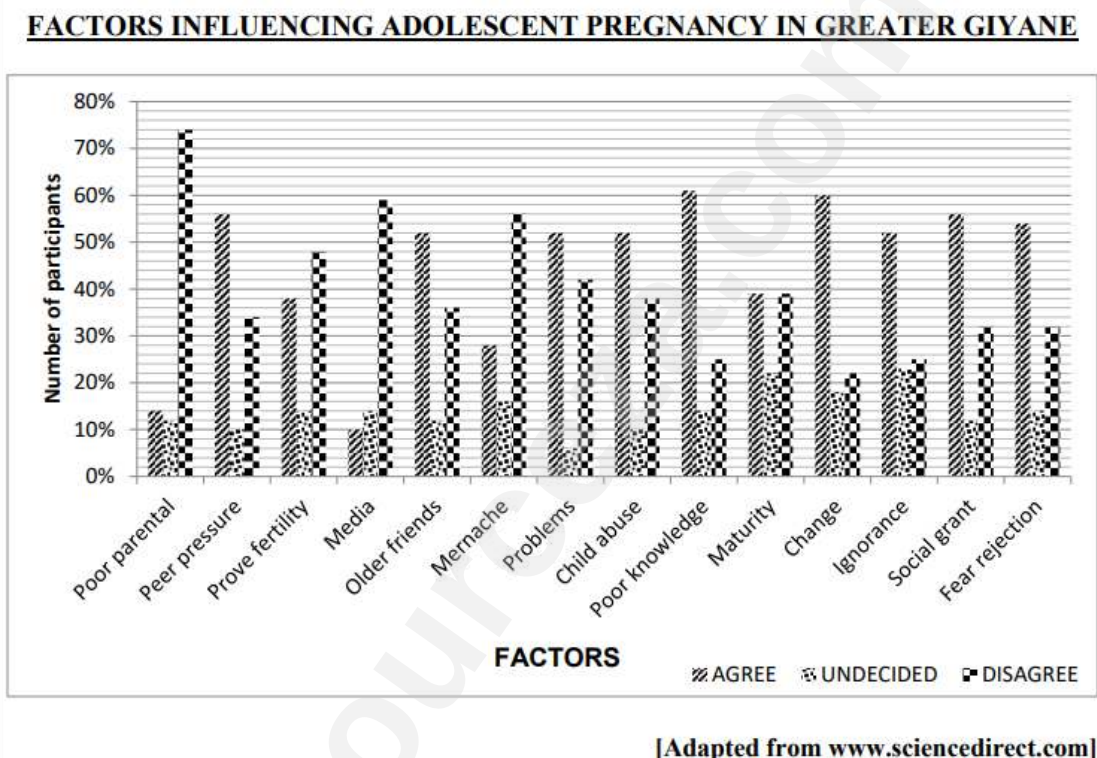
NB: Livestock is the domesticated animals raised in an agricultural setting/farm to produce commodities such as meat, eggs, milk, fur, leather, etc.

[Source: www.dalrrd.gov.za]

Activity 3

LEVEL 1-2 QUESTIONS{3.1.1 , 3.1.2 , 3.1.4 , 3.1.5 , 3.1.6 , 3.2.1 , 3.2.2 ,3.2.3}

- 3.1 A survey was conducted to try and identify factors that influenced adolescent pregnancy rate in the Greater Giyane Municipality, Limpopo Province. The results are shown in the graph below.



Use the graph and the given information above to answer the questions that follow.

- 3.1.1 Define the term '*mode*' in this context. (2)
- 3.1.2 State whether the data shown above is discrete or continuous. (2)
- 3.1.3 Identify the type of graph shown and state one possible reason why the graph was chosen to display the data. (2)
- 3.1.4 Which factor has the greatest influence on adolescent pregnancy in Greater Giyane? (2)
- 3.1.5 If the data was collected from a sample of 150 girls from 4 schools, calculate the number of girls who disagreed with "poor parental" as a factor. (2)
- 3.1.6 Give one disadvantage of the mean. (2)

- 3.2 TABLE 3 below shows the 2020 and 2021 matric results for each of the nine provinces in South Africa.

TABLE 3: PROVINCIAL MATRIC PASS RATES FOR 2020 AND 2021

PROVINCES	PASS RATE IN YEARS		
	2020	2021	PERCENTAGE DIFFERENCE
FREE STATE	85,1%	85,7%	0,6%
GAUTENG	83,3%	82,8%	-0,5%
WESTERN CAPE	79,9%	81,2%	1,3%
NORTH WEST	76,2%	78,2%	2,0%
KWAZULU-NATAL	77,6%	76,8%	F
MPUMALANGA	73,7%	73,6%	-0,1%
EASTERN CAPE	68,1%	73,0%	4,9%
NORTHERN CAPE	66,0%	71,4%	5,4%
LIMPOPO	68,2%	66,7%	-1,5%

[Adapted from www.insideeducation.co.za]

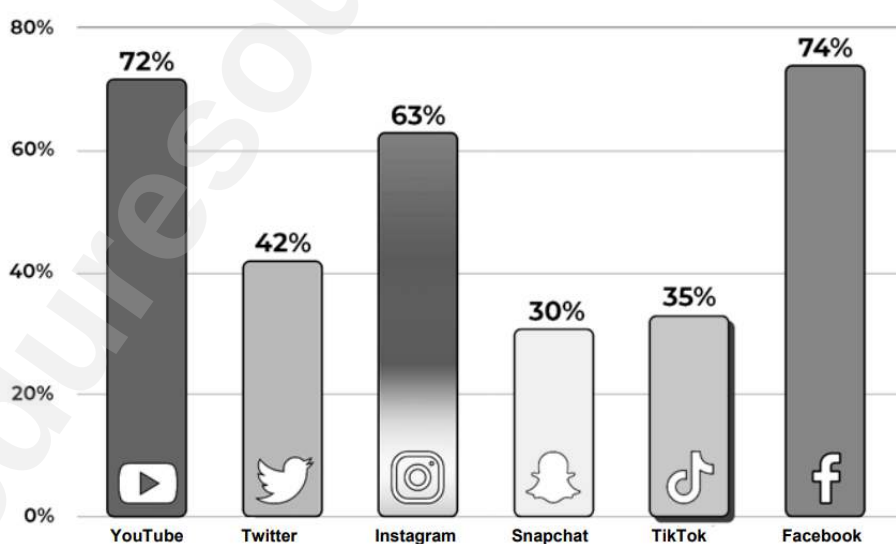
Use the information and the TABLE 3 above to answer the questions that follow.

- 3.2.1 Calculate the missing value **F**. (2)
- 3.2.2 Determine the median percentage difference. (3)
- 3.2.3 Calculate the country's mean percentage pass rate for 2021. (4)

Activity 4**LEVEL 1-2 QUESTIONS**{3.1.1 , 3.1.2 , 3.1.3 , 3.1.4 , 3.2.1 , 3.2.3 , 3.3.1 , 3.3.4}

3.1 Over the past few years, people have relied more on social media platforms to facilitate the creation and sharing of information, ideas and other forms of expression through virtual communities and networks. Study ANNEXURE B and answer the questions that follow.

- 3.1.1 Which social media platform is used the most on a daily basis? (2)
- 3.1.2 Calculate the range of the social media platforms. (2)
- 3.1.3 Name ONE other type of graph that could represent the information about social media platforms. (2)
- 3.1.4 Determine the median of the data provided for social media platforms. (3)
- 3.1.5 Do you think learners should be sheltered (protected) from technology? Give a reason for your answer. (2)

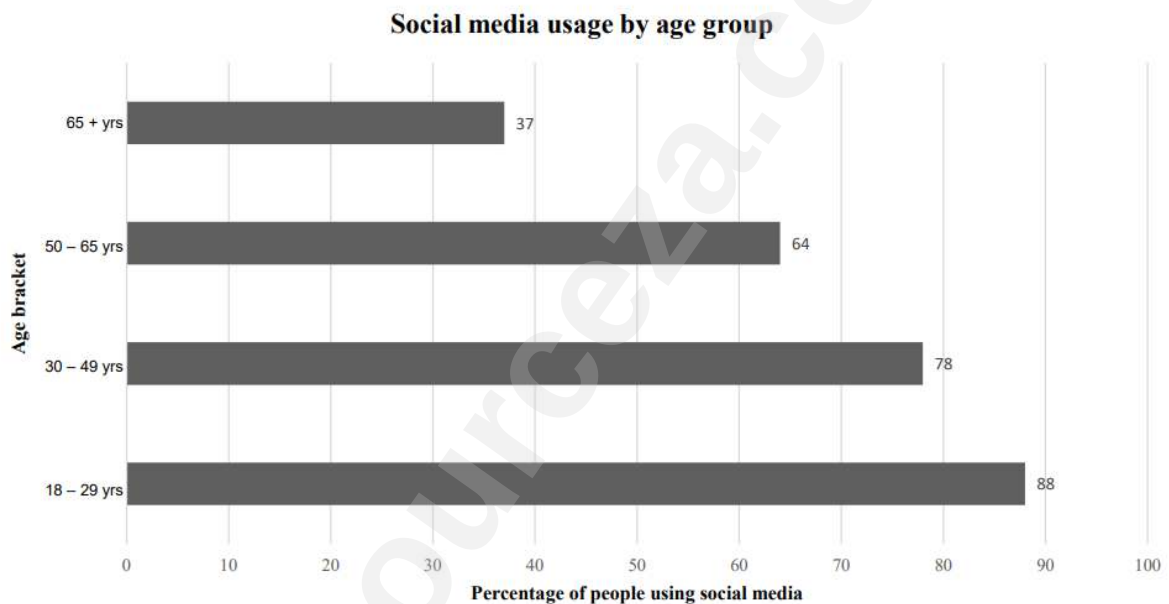
ANNEXURE B**QUESTION 3.1****Percentage of people using social media on a daily basis**

3.2 Social media is being used by all ages. Refer to ANNEXURE C and answer the questions that follow.

- 3.2.1 Which age bracket uses social media the least? (2)
- 3.2.2 Why do you think the younger age bracket uses social media the most? (2)
- 3.2.3 Determine the mean percentage of age groups using social media. (2)

ANNEXURE C

QUESTION 3.2

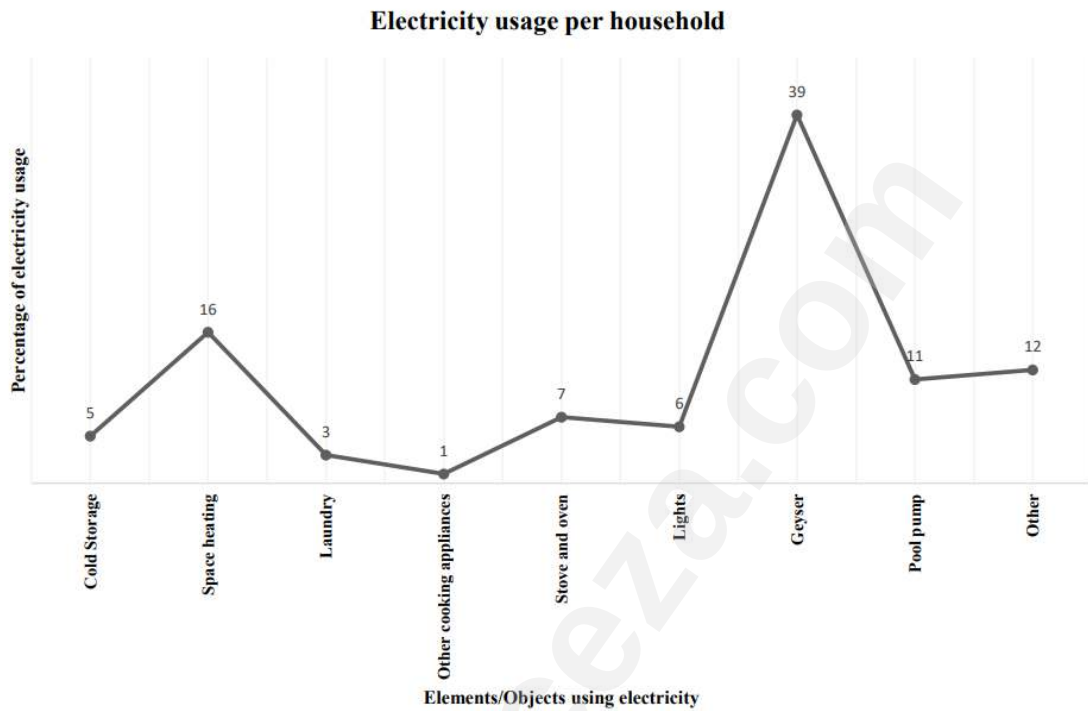


3.3 In order to use social media, electricity is essential. Currently, there are different types of energy being used: renewable energy, coal, solar energy, wind energy, natural gas energy, oil energy etc. Different activities require different amounts of energy usage. Refer to ANNEXURE D, regarding household usage of energy, and answer the questions that follow.

- 3.3.1 Which household activity requires the least amount of energy? (2)
- 3.3.2 Determine the inter-quartile range of the percentage of electricity usage per household. (5)
- 3.3.3 Suggest TWO ways in which electricity usage can be reduced. (4)
- 3.3.4 Write down, as a decimal, the probability of the geyser and space heating using the most electricity. (3)
- 3.3.5 Complete the graph on the ANSWER SHEET provided, regarding household usage of electricity. Detach your ANSWER SHEET from the question paper and insert it in your ANSWER BOOK. (4)

ANNEXURE D

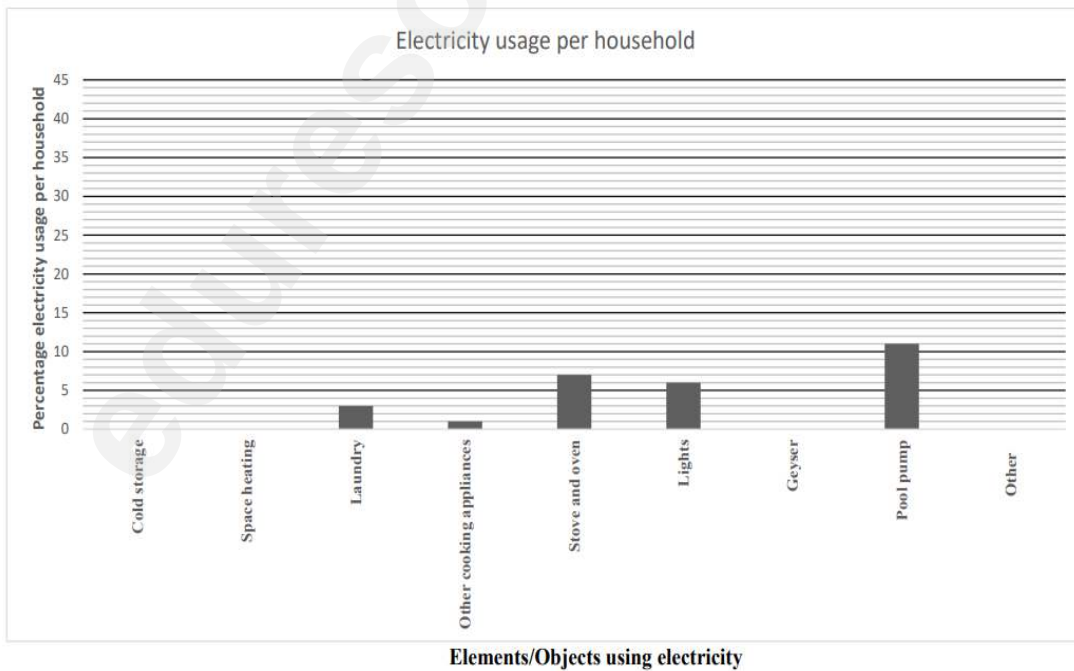
QUESTION 3.3



ANSWER SHEET

Name: _____ GR 12 - ____

QUESTION 3.3.5



Activity 5

LEVEL 1-2 QUESTIONS{3.1.1 , 3.1.2 , 3.1.3 , 3.1.4 , 3.1.5 , 3.2.2 , 3.2.4}

- 3.1 On Annexure B the following information is shown in a graph and a table of values:
- Graph – Average maximum and minimum temperatures of Nelspruit
 - Table 5 – Average maximum and minimum temperatures of Sutherland

Use the graph and TABLE 5 on Annexure B to answer the questions that follow.

- 3.1.1 Write down the month of the year that has the second highest average maximum temperature in Nelspruit. (2)
- 3.1.2 Calculate the difference between the lowest average minimum temperatures, for Nelspruit and Sutherland, in October. (3)
- 3.1.3 Determine the month in Nelspruit, which has the biggest range in temperature. (2)
- 3.1.4 Calculate the median of the average minimum temperatures of Nelspruit. (3)
- 3.1.5 Determine the probability of randomly selecting a month, in Sutherland, with an average minimum temperature lower than $11,1^{\circ}\text{C}$.
Write your answer as a percentage, rounded to the nearest whole number. (3)

- 3.2 The South African Avocado Growers' Association accounts for 95% of South African avocado exports. The majority of avocados exported to Europe and the UK, from the 13th until the 23rd week in 2021, came from Mexico, Peru, South Africa and Colombia.

TABLE 6: EXTRACT OF 2021 SUPPLY OF AVOCADOS (4kg CARTONS) TO EUROPE AND THE UK.

Week in 2021	MEXICO ('000)	PERU ('000)	SOUTH AFRICA ('000)	COLOMBIA ('000)	TOTAL ('000)
13	253	1 391	522	201	2 367
14	100	1 075	649	296	2 120
15	201	1 658	458	227	2 544
16	116	2 438	505	206	3 265
17	148	2 584	754	306	3 792
18	174	2 917	865	M	...
19	116	3 343	877	327	4 663
20	21	3 353	904	127	4 405
21	5	3 263	763	206	4 237
22	5	2 875	851	243	3 974
23	0	2 905	600	264	...
					39 430

[Adapted from <https://www.avocado.co.za>]

Use TABLE 6 to answer the questions that follow.

- 3.2.1 Calculate the average supply of avocados for week 13 to 23 from Mexico. (4)
- 3.2.2 **M** represents the highest number of cartons exported from Colombia. The range for Colombia's supply of avocados for the weeks shown above is 211. Determine the value of **M**. (3)
- 3.2.3 Determine the interquartile range, for South Africa's supply of avocados for week 13 to 23. (5)
- 3.2.4 The probability of a certain country supplying avocados in a certain week is $\frac{227}{2544}$. Identify the name of the country and the particular week. (2)
- [27]

QUESTION 3 [INTERGARATED FINANCE AND DATA HANDLING]

Activity 1

LEVEL 1-2 QUESTIONS{4.1.1a , 4.1.2 , 4.1.3 , 4.2.1 , 4.2.3 , 4.2.4 , 4.3.2}

- 4.1 Mr Buti and his daughter Jane use the same cellphone network provider but each use it under different conditions.

- **Mr Buti is on a contract where:**

- (i) he pays a fixed cost of R200 per month for 100 minutes free and
- (ii) there after a cost of R1,20 per minute, per second billing after the free 100 minutes.
- (iii) **Total costs (R) = $200 + (n - 100) \times 1,20$** ; where n represents minutes used.

- Jane is on a **pre-paid** and pays R1,75 per minute, per second billing.

Mr Buti's call minutes and costs are shown in TABLE 6 below.

TABLE 6: SHOWING COST AND DURATION OF CALLS MR BUTI MADE PER MONTH ON THE CELLPHONE CONTRACT

Total number of call minutes for the month	0	50	100	200	300	D
Total Cost in Rands (R)	200	200	C	320	440	500

Use the information above and TABLE 6 to answer the questions that follow.

- 4.1.1 Calculate the value(s) of:

(a) **C** (2)

(b) **D** (3)

- 4.1.2 Explain the term '*prepaid*' in the context above. (2)

- 4.1.3 Calculate the cost Jane paid in a month she called for 200 minutes. (2)

4.2

Buti has an Eliti account with one of the banks in South Africa.

TABLE 7 shows deposit fees applicable on his account in 2022.

TABLE 7: ELITI ACCOUNT COSTS AT ABA BANK FOR DEPOSITS

TRANSACTION	COSTS
Notes and coin deposit	R80 + R2,25 per R100 (for notes) + R5 per R100 (for coins) or part thereof the amount deposited.

[Adapted by examiner from information supplied by various banks – 2022]

Use the information from TABLE 7 to answer the questions that follow.

4.2.1 Determine the minimum amount one will pay when making a deposit of notes and coins. (2)

4.2.2 Buti says he will be charged R180 when making a deposit of notes to the value of R1 500 and R500 in coins. Show by means of calculations whether his statement is VALID. (5)

4.2.3 Mr Buti deposited R1 500 an amount from sale of goods that were sold at a Value Added Tax (VAT) inclusive price.

Calculate the VAT amount on goods sold. (You may use VAT = 15%) (3)

4.2.4 Name at least ONE method Buti can use to send money to a person who does not have a bank account. (2)

4.3

A tourist from Japan arrived in East London on 26th March 2022, to tour some parts of the Eastern Cape for a period of 5 days. He planned to use an average amount of R4 042,19 per day.

The tourist's first tour was a return trip from East London to Humansdorp. The conditions were as follows:

- The tourist paid for his petrol use on a rented car.
- The rented car is given with full tank and must be returned with a full tank.
- Car rental fee rate is 182 cents per kilometre.

Furthermore, the following details are known.

- The distance from East London to Humansdorp is 368,6 km.
- The cost of petrol was R19,89 per litre at the time.

The tourist opted for a Toyota Corolla 1.6 that uses **7 litres/100 km** on average.

Use the information above to answer the questions that follow.

- 4.3.1 Calculate the total Japanese Yen he exchanged for the 5 days use. If the exchange rates between RSA Rand and Japanese Yen on the day is given as in table below:

SOUTH AFRICAN RAND (ZAR)	JAPANESE YEN (¥)
5	37,51715

[Adapted from Currency Data API/26/03/2022] (4)

- 4.3.2 Calculate the rental fee for the return trip between East London and Humansdorp, excluding petrol used. (3)

- 4.3.3 Calculate the cost of petrol for the return trip above. (4)

[32]

Activity 2

LEVEL 1-2 QUESTIONS{4.1.1 , 4.1.2 , 4.2.1 , 4.2.2 , 4.3.1}

- 4.1 Many South Africans use the weekly advertising in the local newspapers to help with shopping decisions.

TABLE 6 below indicates the number of copies distributed and average monthly household income around some areas in Pretoria.

TABLE 6: NUMBER OF COPIES DISTRIBUTED AND AVERAGE MONTHLY HOUSEHOLD INCOME

Area	Number of distributed copies	Average readership in %	Average monthly household income in Rands (R)
Pretoria East	79 210	76	30 685
Centurion	60 350	61	24 695
Pretoria North	40 100	62	28 435
Moot	33 630	76	20 330
Pretoria West	20 250	70	20 250
Pretoria Far North	29 000	80	14 660
Mamelodi	30 000	76	16 360

[Source: rekord.co.za]

Use TABLE 6 and the information above to answer the question that follow.

- 4.1.1 State the frequency of receiving this newspaper in Pretoria. (2)
- 4.1.2 Write down the mode for the average readership. (2)
- 4.1.3 Determine the interquartile range (IQR) for the average monthly household income in Pretoria.

You may use the formula: $IQR = Q3 - Q1$ (5)

- 4.2 The cost for a quarter of a page to advertise in a local newspaper in the United Kingdom (UK) is £250.

The exchange rate between the South African rand and the United Kingdom pound on 15 November 2021 is given below:

SOUTH AFRICAN RAND (ZAR)	UNITED KINGDOM POUND STERLING (£)
20,38	1
1	0,049

[Source: www.xe.com]

Use the information above to answer the questions that follow.

- 4.2.1 Write down the exchange rate of the South African rand to the UK pound in the form:
 $R1 = \dots$ (2)
- 4.2.2 Determine (in rands) the price for advertising in a local newspaper. (3)

- 4.3 Mr Malinga, a 52-year-old resident at Pretoria North, earned a monthly taxable income of R35 357,00 during the 2021/22 tax year. During this time, Mr Malinga was a member of a medical fund for himself, his wife and his two children.

Table 7 below shows the tax table for the 2021/22 tax year.

TABLE 7: TAX RATES FOR 2021/22 TAX YEAR

TAX BRACKET	TAXABLE INCOME	TAX RATES (in R)
1	1–216 200	18% of the taxable income
2	216 201–337 800	38 916 + 26% of taxable income above 216 200
3	337 801–467 500	70 532 + 31% of taxable income above 337 800
4	467 501–613 600	110 739 + 36% of taxable income above 467 500
5	613 601–782 200	163 335 + 39% of taxable income above 613 600
6	782 201–1 656 600	229 089 + 41% of taxable income above 782 200
7	1 656 601 and above	587 593 + 45% of taxable income above 1 656 600

[Adapted from www.sars.gov.za]

Table 8 below shows the tax rebates and medical tax credits for the 2021/22 tax year.

TABLE 8: TAX REBATES AND MEDICAL TAX CREDITS FOR 2021/22 TAX YEAR

TAX REBATES	
Primary	R15 714
Secondary (65 and older)	R8 613
Tertiary (75 and older)	R2 871
MEDICAL TAX CREDITS PER MONTH	
Main member	R332
First member	R332
Each additional member	R224

[Adapted from www.sars.gov.za]

Use TABLES 7 and 8 above to answer the question that follow.

- 4.3.1 Determine Mr Malinga's annual taxable income. (2)
- 4.3.2 Show with calculations that Mr Malinga will receive R13 344 medical tax credits for the 2021/22 tax year. (4)
- 4.3.3 Calculate the amount of tax Mr Malinga must pay for 2021/22 tax year. (6)

[26]

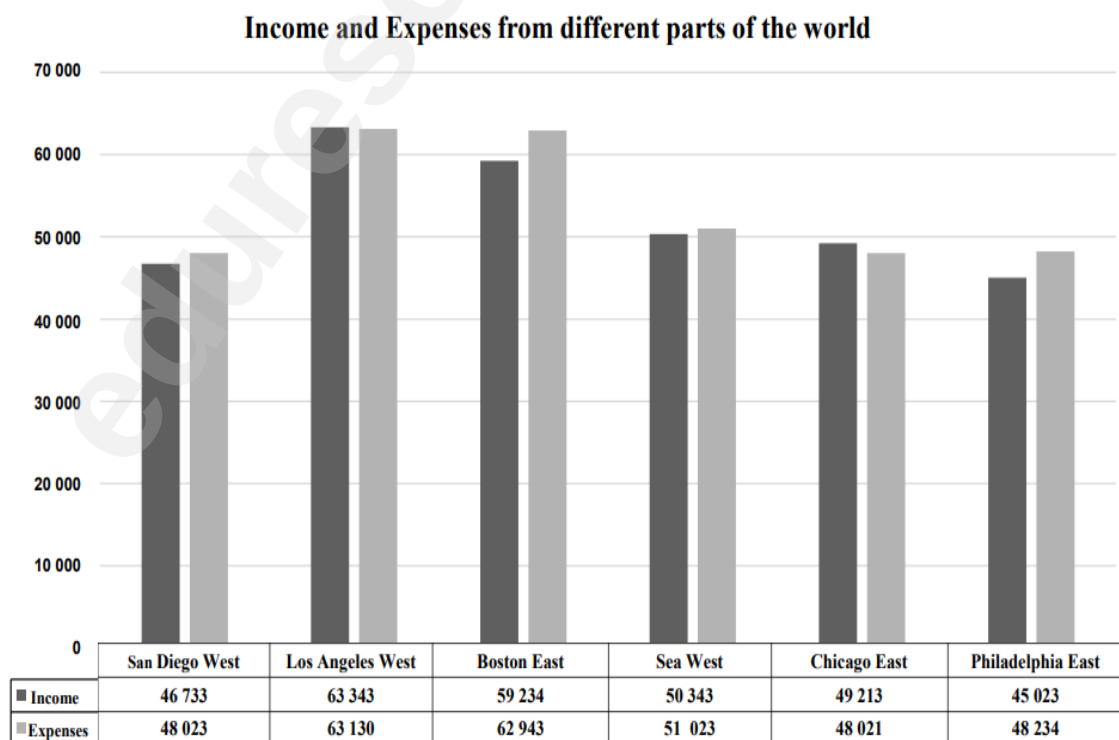
Activity 3

LEVEL 1-2 QUESTIONS{4.1.1 , 4.1.2 , 4.1.3 , 4.1.4 , 4.1.5 , 4.2.1 , 4.2.2 , 4.2.3 , 4.2.4 , 4.2.5 , 4.2.6 , 4.3.1 , 4.3.2}

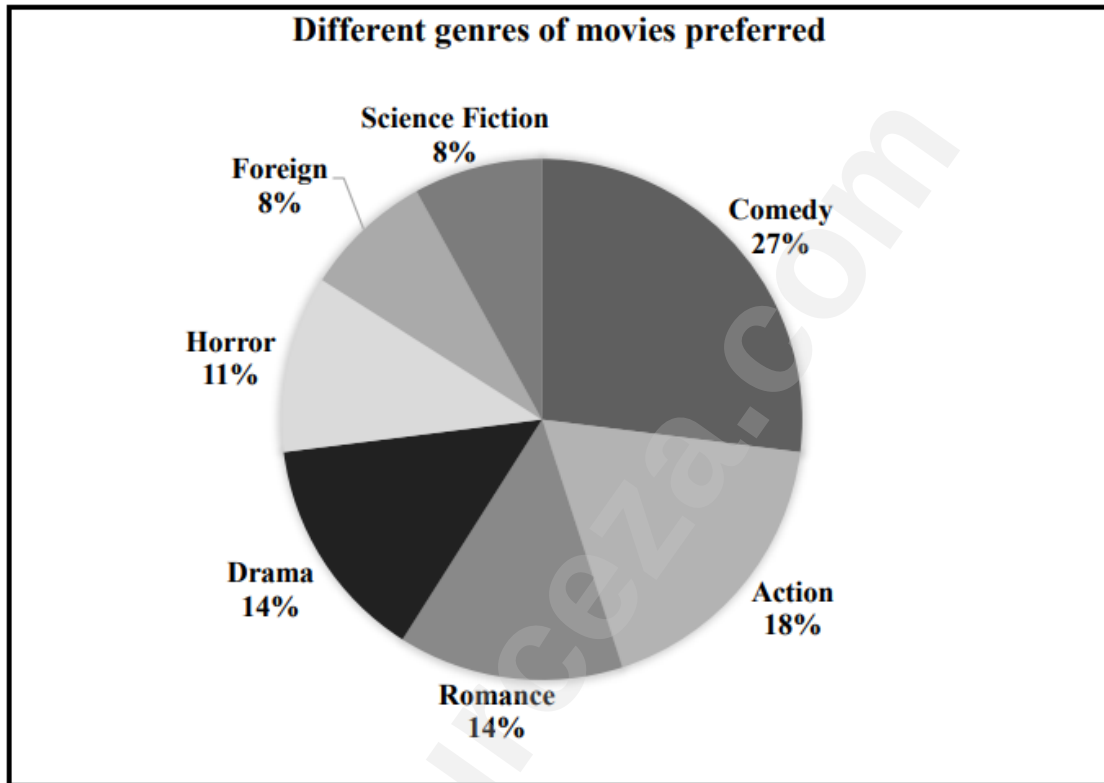
- 4.1 The cost of living has increased significantly in all countries. Income received from employers does not cover expenses. Refer to ANNEXURE E and answer the questions that follow.
- 4.1.1 Determine the difference in income between the people living in Los Angeles West and the people living in Boston East. (2)
- 4.1.2 Which city had the lowest expenses? (2)
- 4.1.3 Determine the implications of expenses exceeding income. (2)
- 4.1.4 Would an increase in salary have an impact on tax payments? Explain your answer. (3)
- 4.1.5 Determine the percentage difference between the income and expenses of people living in Chicago East. (4)

ANNEXURE E

Question 4.1



- 4.2 The Grade 12s of High School Rouge decided to host a movie night as a fundraiser for their matric farewell. They interviewed some learners and educators at school about the different genres of movies they would prefer. Refer to the pie chart below and answer the questions that follow.



- 4.2.1 If 180 learners and 20 educators were interviewed, how many people preferred science fiction movies? (3)
- 4.2.2 Determine the mode for the data provided on movie genres. (2)
- 4.2.3 Determine the probability of randomly selecting a person who prefers the horror genre. (2)
- 4.2.4 What is the probability of randomly selecting a person who prefers the comedy genre? (2)
- 4.2.5 Determine Quartile 1 (Q1) if the Interquartile range (IQR) is 10% and Quartile 3 (Q3) is 18%. (3)
- 4.2.6 Write, as a ratio, the percentage of people preferring action movies to those who prefer horror movies. Write your answer in unit form. (3)

- 4.3 The individual tax rates for the tax year 2022 is shown on ANNEXURE F.
Use ANNEXURE F to answer the following questions.

- 4.3.1 Trevor is a 67-year-old plumber who earned an annual taxable income of R126 500 in 2021. Did he meet the tax threshold requirements for 2021?
Explain what this means. (2)
- 4.3.2 What information is needed to determine a person's rebate? (2)
- 4.3.3 Mr Naidoo is a 72-year-old who earns a taxable income of R55 250 per month, after deductions in the 2022 tax year. He claims that more than $\frac{1}{4}$ (one quarter) of his annual taxable income is paid to SARS. Verify, showing all calculations, whether his claim is correct. (7)

[39]

ANNEXURE F

QUESTION 4.3

2022 TAX YEAR (1 March 2021 – 28 February 2022)

Tax income (R)	Rates of tax (R)
1 – 216 200	18 % of taxable income above 216 200
216 201 – 337 800	38 916 + 26% of taxable income above 216 200
337 801 – 467 500	70 532 + 31% of taxable income above 337 800
467 501 – 613 600	110 739 + 35% of taxable income above 467 500
613 601 – 782 200	163 335 + 39% of taxable income above 613 600
782 201 – 1 656 600	229 089 + 41% of taxable income above 782 200
1 656 601 and above	587 593 + 45% of taxable income above 1 656 600

Tax Rebates – see changes from previous year

Tax Rebate	Tax Year							
	2022	2021	2020	2019	2018	2017	2016	2015
Primary (age below 65)	R15 714	R14 958	R14 220	R14 067	R13 635	R13 500	R13 257	R12 726
Secondary (65 to 74)	R8 613	R8 199	R7 794	R7 713	R7 479	R7 407	R7 407	R7 110
Tertiary (75 and older)	R2 871	R2 736	R2 601	R2 574	R2 493	R2 466	R2 466	R2 367

Tax Thresholds – see changes from previous year

Age	Tax Year							
	2022	2021	2020	2019	2018	2017	2016	2015
Under 65	R87 300	R83 100	R79 000	R78 150	R75 750	R75 000	R73 650	R70 700
65 to 74	R135 150	R128 650	R122 300	R121 000	R117 300	R116 150	R114 800	R110 200
75 and older	R151 100	R143 850	R136 750	R135 300	R131 150	R129 850	R128 500	R123 350

Activity 4

LEVEL 1-2 QUESTIONS{4.1.1 , 4.2.1 , 4.2.2 , 4.2.3 , 4.3.1 , 4.3.2 }

- 4.1 In the Zulu culture the bride groom is expected to pay lobola by sending 11 cows to the bride's family. Siyacela invested R60 000 at the end of December 2018 at 9,8% per annum simple interest to raise money for lobola.

He hopes to pay lobola end of December 2024. On average the current (2022) cost of a lean cow is R8 500. The projected livestock inflation rates for 2023 and 2024 are 11,8% and 9% respectively.



[Adapted from www.ultralix.com]

Use the given information above to answer the questions that follow.

- 4.1.1 Calculate manually the total interest earned on the investment will be at the end of 2024. (4)
- 4.1.2 Use the projected livestock inflation rates to calculate the cost of each lean cow in 2024. (7)
- 4.1.3 Show with calculations whether Siyacela will have enough money to buy the 11 cows in 2024. (5)
- 4.1.4 Siyacela's sister wants to donate \$1 450 to assist him with lobola. This amount is equivalent to R21 117,51. Determine the exchange rate in the form: $\$1 = R \dots$ (2)

- 4.2 People prefer to buy lean cows because they are cheaper. The buyer will have to feed them for a certain period of time. The frequency table below shows the masses of lean cows in a nearby cattle farm.

TABLE 4: MASSES OF LEAN COWS IN KILOGRAMS

INTERVAL (KG)	FREQUENCY	CUMULATIVE FREQUENCY
220 – 229	15	15
210 – 219	28	43
200 – 209	9	52
190 – 199	12	64
180 – 189	7	71
170 – 179	10	81
160 – 169	20	101
159 – 159	7	108
140 – 149	11	119
130 – 139	4	123
120 – 129	2	125

Use the TABLE 4 above to answer the following questions.

- 4.2.1 Which statistical cycle stage is shown by the table above? (2)
- 4.2.2 Determine the number of cows that weighed less than 170 kg. (2)
- 4.2.3 Calculate the percentage of cows that weigh more than 180 kg. (3)

- 4.3 The two-way table below shows the Mathematical Literacy test results from 1 550 learners in one of the districts in KZN.

TABLE 5: MATHEMATICAL LITERACY TEST RESULTS

	PASS	FAIL	TOTALS
BOYS	350	G	460
GIRLS	820	270	H
TOTALS	1 170	380	1 550

Use TABLE 5 above to answer the questions that follow.

- 4.3.1 Calculate the missing values of **G** and **H**. (4)
- 4.3.2 Use the two-way table above to determine the probability that a learner chosen at random is a boy that passed the test. Write the answer as a fraction in its simplest form. (3)

Activity 5

LEVEL 1-2 QUESTIONS{4.1.1 , 4.1.2 , 4.1.3 , 4.2.1 , 4.3.2}

- 4.1 Table 7 below provides information on South African residents and foreign travellers who entered or left South Africa during certain months in 2020 and 2021, plus the year-on-year percentage change.

TABLE 7: NUMBER OF SOUTH AFRICAN RESIDENTS AND FOREIGN TRAVELLERS BY TRAVEL DIRECTION.

	October 2020	September 2021	October 2021	% Change (Oct 2020 – Oct 2021)
Total	401 212	857 448	1 001 594	149,6%
South African residents	157 271	298 109	349 432	A
• Arrivals	77 240	141 678	173 890	125,1%
• Departures	80 018	156 294	175 352	116,1%
• Transits	13	137	190	1361,5%
Foreign travellers	243 941	B	652 162	167,3%
• Arrivals	124 165	291 042	337 611	171,9%
• Departures	118 952	256 354	298 073	150,6%
• Transits	824	11 943	16 478	1899,8%

[Adapted from source: <https://www.statssa.gov.za>]

Use TABLE 7 to answer the questions that follow.

- 4.1.1 Write down, in words, the total number of travellers during the month of October 2021. (2)
- 4.1.2 Explain why the total number of travellers in October 2020 were so much less than the travellers in October 2021. (2)
- 4.1.3 Calculate A, the percentage change of the South Africans who travelled in October 2020 and October 2021. Round your answer to one decimal.

The following formula may be used.

$$\% \text{ Change} = \frac{\text{October 2021} - \text{October 2020}}{\text{October 2020}} \times 100\% \quad (4)$$

- 4.1.4 Calculate the Foreign travellers as a percentage of the total travellers in September 2021. (4)

- 4.2 Simon is a 56-year-old businessman. He receives an annual gross salary of R582 720. His annual taxable income is R539 016. His spouse and two children are on Simon's medical aid.

TABLE 8 indicates the tax tables for the 2021/2022 tax year.

TABLE 8: TAX RATES FOR THE 2021/2022

TAXABLE INCOME (R)	RATES OF TAX (R)
1 – 216 200	18% of taxable income
216 201 – 337 800	38 916 + 26% of taxable income above 216 200
337 801 – 467 500	70 532 + 31% of taxable income above 337 800
467 501 – 613 600	110 739 + 36% of taxable income above 467 500
613 601 – 782 200	163 335 + 39% of taxable income above 613 600
782 201 – 1 656 600	229 089 + 41% of taxable income above 782 200
1 656 601 and above	587 593 + 45% of taxable income above 1 656 600

ANNUAL TAX REBATES

AGE	AMOUNT (R)
Primary	15 714
Secondary (65 years and older)	8 613
Tertiary (75 years and older)	2 871

MEDICAL AID TAX CREDITS

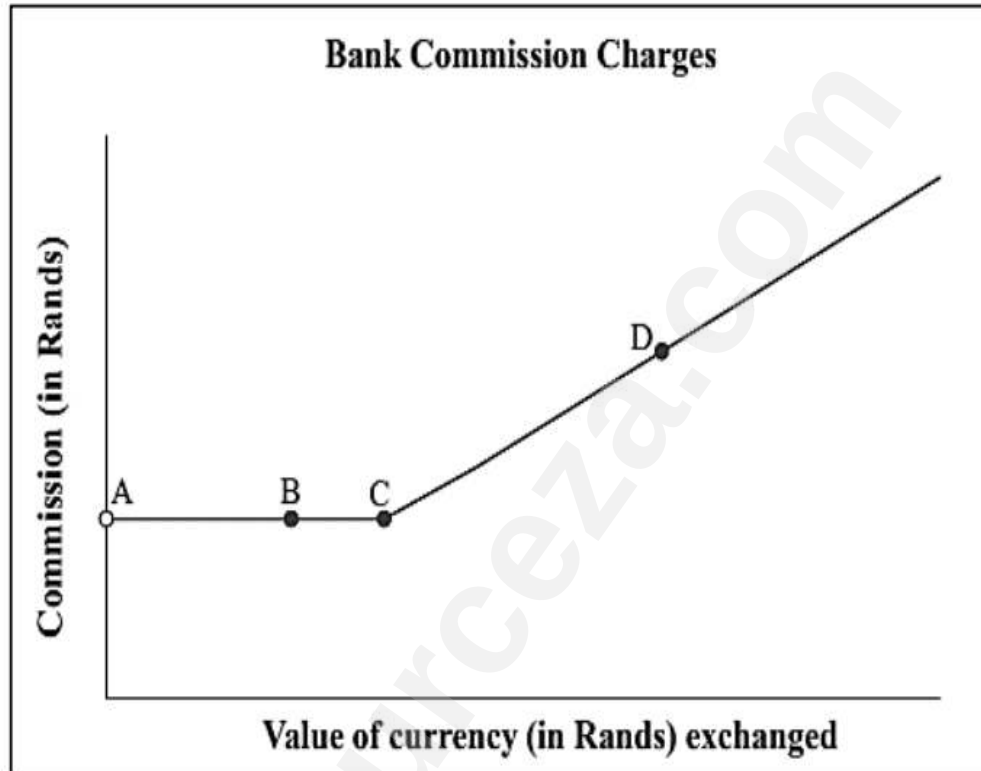
CRITERIA	AMOUNT PER MONTH (R)
For the taxpayer	332
For the taxpayer and one dependant	664
For each additional dependant	224

[Source: www.sars.gov.za/tax-rates]

Use TABLE 8 and the information supplied to answer the questions that follow.

- 4.2.1 Define the term “gross monthly salary” in this context. (2)
- 4.2.2 Simon stated that his annual tax contribution to SARS is R120 198,76. Verify, showing ALL calculations, whether his statement is valid. (8)
- 4.2.3 Simon received a salary increase of 6,38%. Determine what his new gross monthly salary would be. (5)

- 4.3 A certain bank charges 2,28% commission on the amount to be exchange with a minimum charge of R100,80.
The graph below illustrates the structure of the bank's commission.



[Source: Adapted from www.standardbank.co.za]

Use the graph and the information above to answer the questions that follow.

- 4.3.1 Explain the meaning of the open circle on the graph at point A within the given context. (2)
- 4.3.2 Write down the commission charged at point B. (2)
- 4.3.3 Calculate the amount exchanged if the commission charged at point D is R114,00. (3)

[34]

QUESTION 4 [INTERGRATED FINANCE AND DATA HANDLING]

Activity 1

LEVEL 1-2 QUESTIONS{5.1.1 , 5.1.2 , 5.2.1 , 5.2.2 , 5.2.4 , 5.2.5 , 5.3.1}

5.1 TABLE 9 below shows the cost of movie tickets at Gompo Mall in 2021 and 2022.

TABLE 9: COST OF MOVIE TICKETS AT GOMPO MALL IN EAST LONDON

STANDARD PRICING (2D)		
CATEGORY (AGE OF MOVIE ATTENDEES)	2021 Ticket cost	2022 Ticket cost
Children under 18	R40	R60
Adults (above 18 less than 65)	R45	R65
Pensioners (65 and above)	R40	R60

- In May 2021, ticket sold were 60% of May 2022 sales.
- 930 movie tickets were sold in May 2022.
- On the average number of tickets sold in May 2021 and May 2022 were in the ratio: **Adults : Children : Pensioners = 2 : 3 : 1**

[Adapted from hemingways.co.za]

Use TABLE 9 and the information above to answer the questions that follow.

5.1.1 Determine the number of tickets bought by children under 18 in May 2022. (2)

5.1.2 Determine the amount received from tickets bought by adults in May 2021. (3)

5.2 ANNEXURE C shows pie charts about tourists from other countries to South Africa in the years 2019 and 2020.

Use ANNEXURE C to answer the questions that follow.

5.2.1 Name another type of graph you can use to display the information in ANNEXURE C. (2)

5.2.2 Identify the country that had the least number of visitors in 2020. (2)

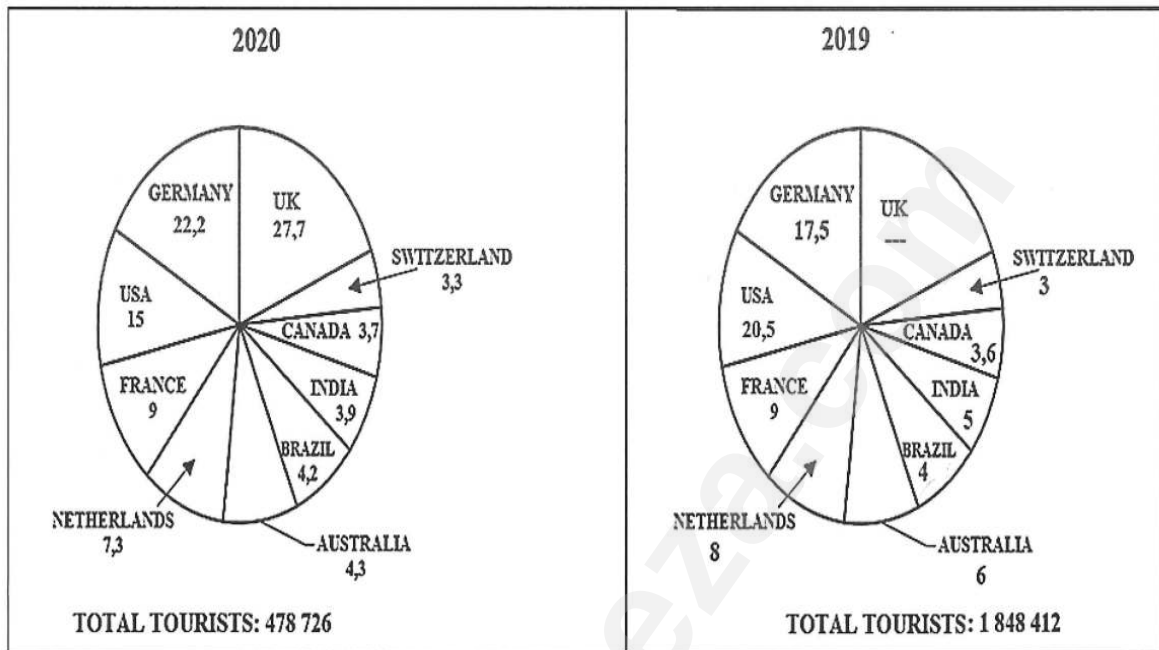
5.2.3 Inako said that 435 582 tourists came from the UK in 2019. Verify, showing ALL calculations, whether his statement is CORRECT. (6)

5.2.4 Determine the probability (as a decimal) of randomly selecting a tourist from a country that showed neither decrease or an increase in the number of visitors. (3)

5.2.5 Give ONE possible reason why there was a decrease in the number of tourists from other countries to South Africa in 2020 compared to 2019. (2)

ANNEXURE C: QUESTION 5.2

COUNTRY OF ORIGIN AND PERCENTAGE OF TOURISTS VISTING THE REPUBLIC OF SOUTH AFRICA (RSA) IN 2020 AND 2019



[Source: <http://www.statssa.gov.za>]

5.3 Mr Jabu lives in Komani, in the Enoch Mgijima Municipality and uses prepaid electricity that is sold to customers at a VAT inclusive rate.

TABLE 10 below shows the cost of prepaid units of electricity.

TABLE 10: COST OF PREPAID UNITS OF ELECTRICITY

BLOCK	UNITS (kWh)	RATE c/kWh (INCLUDING VAT)
1	0 – 50	144,72
2	51 – 350	186,06
3	351 – 600	261,87
4	> 600	308,37

[Source: https://www.enochmgijima.org.za/electricity_tariffs2021/2022]

* **Prepaid electricity:** Paying for electricity before using it.

* VAT (Value Added Tax) = 15%

* The municipality buys electricity from Eskom at an average VAT inclusive price of R1,33 per kWh.

Use TABLE 10 above to answer the questions that follow.

5.3.1 State any TWO reasons why it is an advantage for the municipality to sell prepaid electricity. (2)

5.3.2 Determine the number of units Mr Jabu received when he bought prepaid electricity for R68,02. (3)

5.3.3 Mr Jabu stated that the percentage profit the municipality makes when a customer buys 290 kWh of electricity is more than 34%.

Verify, by showing ALL calculations, if his claim is VALID.

You may use the formula:

$$\% \text{ Profit} = \frac{\text{sell price for the units} - \text{cost price for the units}}{\text{cost price for the units}} \times 100\%$$

(6)
[31]

Activity 2

LEVEL 1-2 QUESTIONS{5.1 , 5.2 , 5.3.1 , 5.3.3 , 5.3.4}

Mogodu Monday has become a popular South African weekly occasion wherein many celebrate the most unpopular day of the week by turning it into an enjoyable time over great food with family and friends. During this day, mogodu is often enjoyed with a side of warm pap, samp or dumpling.

A small business sells a plate of mogodu for R50,00.

NOTE WELL	PLATE OF MOGODU SERVED WITH PAP
Mogodu is a combination of chopped tripe and intestines served as a stew. Pap is a traditional porridge made from maize meal.	

The cost to make one plate of mogodu is given by the following formula:

Total cost = R1 200 + 26 m where m = number of plates

[Adapted from #ReMojaKaofela@MojaCafe]

Use the information above to answer the questions that follow.

5.1 Use the equation above to determine the number of plates sold if the total cost is R2 760. (4)

5.2 Construct a formula that can be used to calculate the income from selling mogodu, in the form:
Income = ... (2)

- 5.3 TABLE 9 below shows the total cost and income from selling plates of mogodu.

TABLE 9: COST AND INCOME OF SELLING PLATES OF MOGODU

Number of plates	0	10	30	50	70	90	100
Cost (R)	1 200	1 460	1 980	2 500	3 020	3 540	3 800
Income (R)	0	500	1 500	2 500	3 500	4 500	5 000

- 5.3.1 Explain the term *break even* in this context and identify the number of plates that must be sold to break even. (3)

- 5.3.2 The manager of the small business stated that she could make a $\frac{8}{25}$ profit on 100 plates of mogodu sold.

Verify, showing ALL calculations, if his statement is correct. (6)

- 5.3.3 Write down the type of graph that can be used to represent the information on TABLE 9 above. (2)

- 5.3.4 The income graph has already been drawn on the attached ANSWER SHEET.

Use the information from Table 9 to draw on the same set of axes a graph representing the cost of plates of mogodu. (3)

[20]

Activity 3

LEVEL 1-2 QUESTIONS{5.1.1 , 5.3.1}

- 5.1 Nomsa grows and sells amadumbe (yams) to raise extra cash to support her family. She sells amadumbe in 5 kg packs for R30 per pack. Each empty red mesh bag costs her R5. The total fix cost is R500 per month excluding the red mesh bags.



Use the information above to answer the questions that follow.

- 5.1.1 The formula below is used to calculate Nomsa's total cost for the month.

$$\text{Total Cost (R)} = \text{R500} + \text{R5} \times \text{number of mesh bags}$$

TABLE 3: TOTAL COST/INCOME FOR AMADUMBE PACKS

NUMBER OF AMADUMBE PACKS	0	20	40	Q	80
TOTAL COST (R)	500	P	700	825	900
TOTAL INCOME (R)	0	600	1 200	1 950	2400

(4)

Use the given formula above to calculate the values of **P** and **Q**.

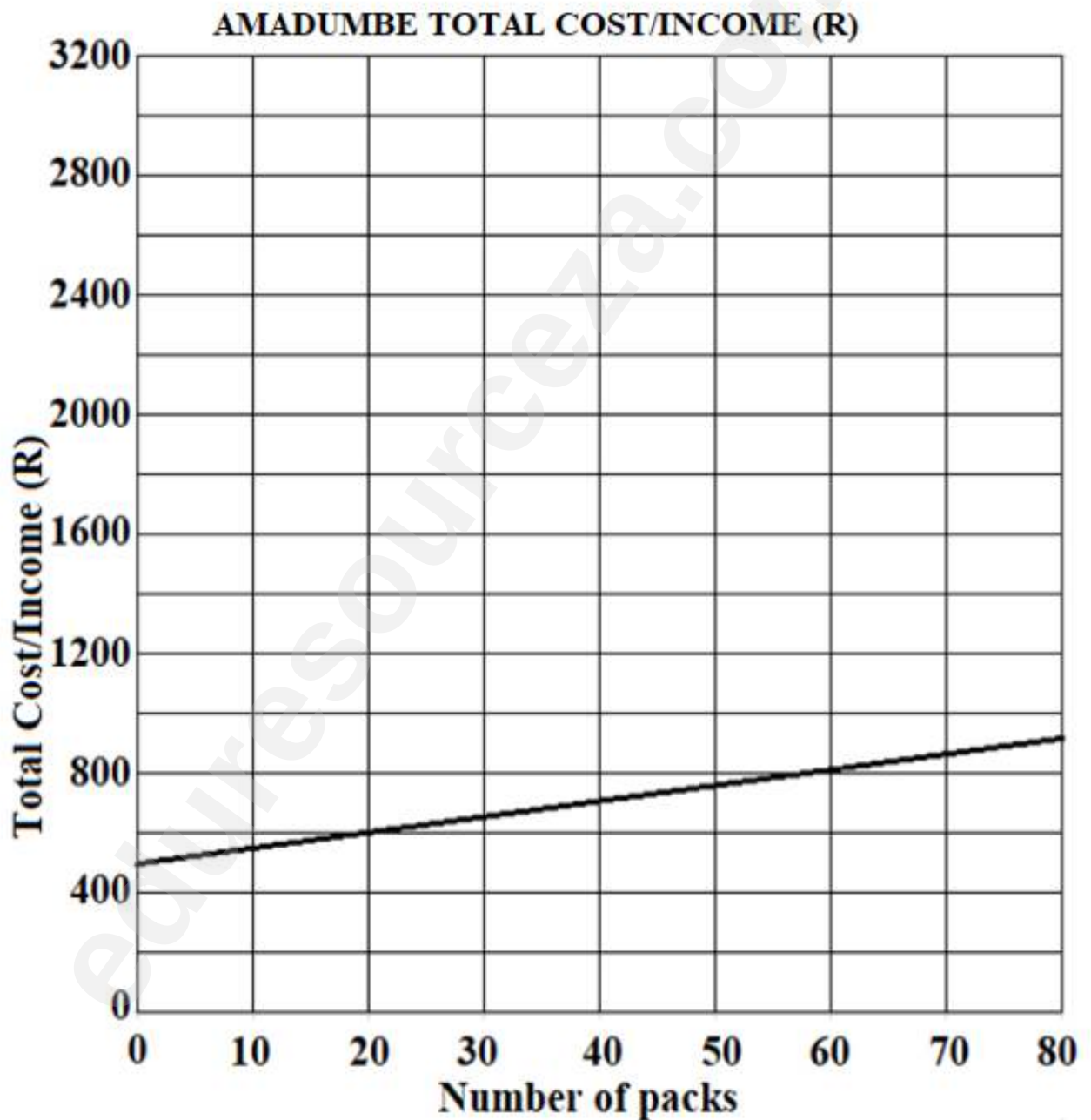
- 5.1.2 The graph for total cost is drawn on the ANSWER SHEET provided. On the same set of axes draw the graph for total income. (4)
- 5.1.3 Explain the importance of understanding the break-even point in the given context. (2)

ANSWER SHEET

QUESTION 5.1.2

NAME OF LEARNER: _____

GRADE 12 _____



- 5.2 Nomsa wants to buy a used bakkie. She viewed an Autotrader on the internet as shown below.

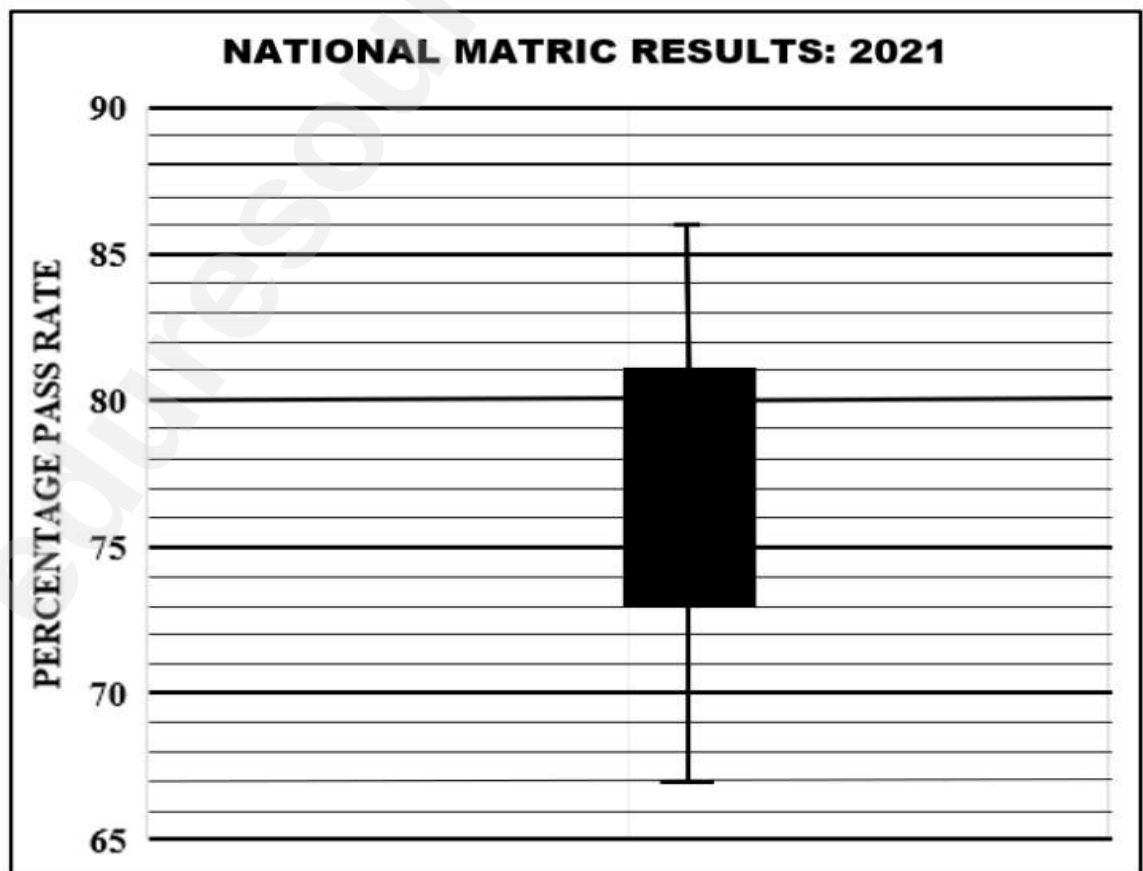
Retail price: R150 000
 Deposit: R30 000
 Repayment period: 6 years
 Monthly instalment: R2 208,00
 Estimated interest rate: 9,75% p.a



[Adapted from www.autotrader.co.za]

- 5.2.1 Calculate the real cost of the loan.
 You may use the formula:
Real cost of the loan = monthly repayment $\times$ total number of months. (3)
- 5.2.2 Show how the total interest of **R38 976,00** was calculated. (4)

- 5.3 The box-and-whisker plot below shows the 2021 matric pass rates for the nine provinces rounded off to the nearest whole numbers.



[Adapted from www.careersportal.co.za]

Use the box-and-whisker plot and the information above to answer the following questions.

5.3.1 Write down the minimum and maximum pass rates. (2)

5.3.2 One Mathematical Literacy learner stated that the difference between the range and the Inter-Quartile Range (IQR) is 12%. Verify, using calculations whether the statement is correct.

You may use the formula: $IQR = Q_3 - Q_1$ (6)

5.3.3 Free State Province had the highest pass rate for 2021 matric results. If 35 055 Grade 12 learners wrote, calculate the number of learners who failed. (4)
[29]

Activity 4

LEVEL 1-2 QUESTIONS{5.1.1 , 5.1.2 , 5.1.3 5.1.4 , 5.1.5 , 5.1.6 , 5.2.1}

- 5.1 Duncan sells avocados at his local Food market. He rents a food stall inside the Food market for R450 per month. He buys the avocados (2 kg pocket) for R35,00 (incl. VAT) from the Johannesburg market and pays R800,00 transport each month. He works in the stall each day.

The total cost for the avocados is given by the following formula:

Total cost = R1 250 + (R35 × t), where t = number of 2 kg avocado pockets



He sells each pocket of avocados for R85,00.

Table 9 below shows the total cost and total income for selling the avocados.

TABLE 9: TOTAL COST AND INCOME FOR SELLING AVOCADOS

Number of avocado 2kg pocket	0	10	15	35	50	80	100
Total cost (rand)	1 250	1 600	1 775	B	3 000	4 050	4 750
Total income (rand)	0	850	A	2 975	4 250	6 800	8 500

[Adapted from source: www.joburgmarket.co.za]

Use TABLE 9 and the information above to answer the questions that follow.

- 5.1.1 Write down the fixed cost for Duncan's business. (2)

- 5.1.2 Calculate the cost of a pocket of avocados that Duncan buys at Johannesburg market, **excluding VAT**. (3)

5.1.3 Calculate the profit that Duncan will make if he sells 80 pockets of avocados per month. (3)

5.1.4 Calculate the missing values **A** and **B**. (4)

5.1.5 A line graph representing the total cost for selling avocados is drawn on ANSWER SHEET 1.

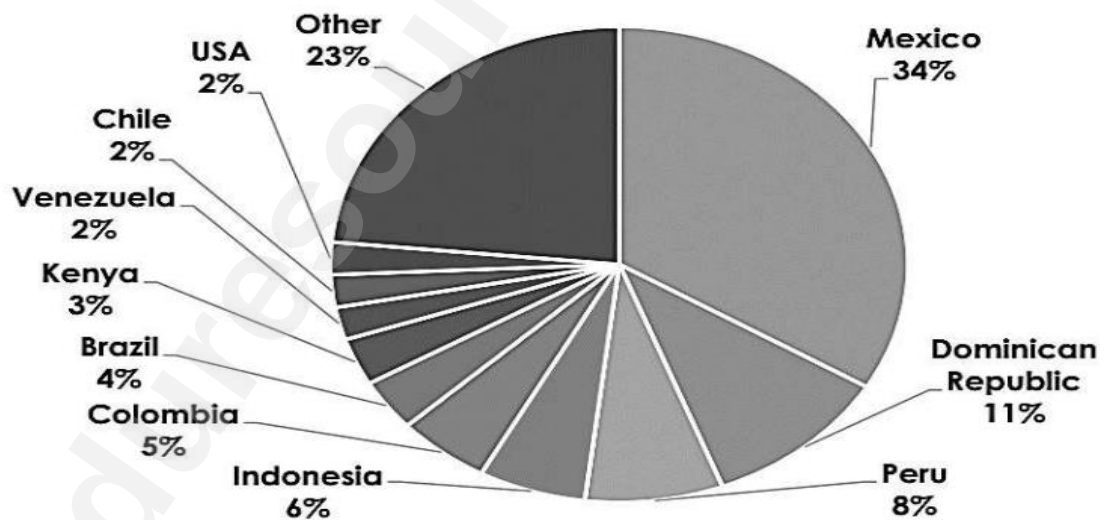
Draw on the same set of axes a line representing the total income for selling avocados. (4)

5.1.6 Write down the break-even point for Duncan's food stall by using your answer from question 5.1.5. (2)

5.1.7 The projected inflation rate for 2022 is 4,8% and 2023 is 4,3%.

Calculate the projected price that Duncan is going to pay for a pocket of avocados in 2024. (5)

5.2 The pie chart below shows the Major avocado producing countries in the world. Avocado has increasingly found attention or a growing share in the international markets.



[Source: <https://www.elsenburg.com/>]

Use the graph and the information above to answer the questions that follow.

- 5.2.1 Identify the country that produces the 3rd most avocados in the world. (2)
- 5.2.2 South Africa also produces avocados. Explain where in the above graph its share would be found and why. (2)
- 5.2.3 A statistician states that the Dominican Republic, Indonesia and Kenya produces one fifth of the global share of avocados. Show, by means of calculations whether he is correct. (4)
- [31]

QUESTION 5 (INTERGRATED LEVEL 1 QUESTIONS FINANCE AND DATA HANDLING)

Activity 1

LEVEL 1-2 QUESTIONS{ALL QUESTIONS ARE LEVEL 1}

- 1.1 To determine the price of petrol per litre in South Africa, the current petrol pricing model uses the four main components shown in the TABLE 1 below.

TABLE 1: FOUR COMPONENTS DETERMINING THE PRICE OF PETROL PER LITRE

COMPONENTS OF THE PETROL PRICING MODEL	NOVEMBER PRICE FOR 2011	PERCENTAGE (%) INCREASE OF PETROL	NOVEMBER PRICE FOR 2021
Basic petrol price	R6,29	49	R9,37
Other levies	R1,91	114	R4,09
Road accident fund	R0,80	173	R2,18
Petrol levy	R1,78	116	R3,83
	NOVEMBER PRICE FOR 2011		NOVEMBER PRICE FOR 2021
Rand per litre of petrol	R10,77	80,78	R19,47

[Data courtesy of the Automobile Association: IOL. Motoring/2021]

Use TABLE 1 to answer the questions that follow.

- 1.1.1 Show how the price of R19,47 per litre of petrol in November 2021 was determined. (2)
- 1.1.2 Write down the percentage increase of the least price determining component of the price per litre of petrol. (2)
- 1.1.3 Show how the basic petrol price component in November 2021 was determined using the basic petrol price of 2011. (3)

- 1.2 Jane has a cellphone on a prepaid arrangement with a network that provides 1 gigabyte (GB) of data at a cost of R149,00.

NOTE: 1 GB = 1 000 MB (megabytes)

1 MB = 1 000 KB (kilobytes)

TABLE 2 below shows a list of cellphone applications Jane updated in the month of May 2022.

TABLE 2: CELLPHONE APPLICATIONS UPDATED IN MAY 2022

APPLICATIONS UPDATED	DATA USED TO UPDATE (in MB)
Google Drive	27,45
Dropbox	90
Facebook	---
Messages	43
YouTube	125
TOTAL DATA	400,45

Use the information and TABLE 2 above to answer the questions that follow.

- 1.2.1 Determine the data used for updating Facebook. (2)
- 1.2.2 Calculate the total cost of the data used in updating the above five (5) cellphone applications. (3)
- 1.2.3 Calculate the data balance in kilobytes remaining after updating all the cellphone applications in May 2022. (3)

- 1.3 ANNEXURE A shows an income and expenditure statement for Buzingo Private School.

The statement shows a comparison of budgeted and actual values for the year 2020.

Use the information in ANNEXURE A to answer the questions that follow.

- 1.3.1 Calculate the total actual income for the school in 2020. (2)
- 1.3.2 The value of the actual net income in 2020 is indicated as negative. What does *negative value* mean? (2)
- 1.3.3 Identify ONE item within the 'Income' which could have been the main cause for the school to have a negative value. (2)

ANNEXURE A: QUESTION 1.3

BUZINGO PRIVATE SCHOOL			
BUDGET FOR THE YEAR 2020			
SUMMARY	ACTUAL 2019 AMOUNT IN (R)	BUDGETED 2020 AMOUNT IN (R)	ACTUAL 2020 AMOUNT IN (R)
Total Income	650 500	650 500	-----
Total Expenses	561 387,50	595 650	487 776,50
Net Income	89 112,50	54 850	-113 026,50
Income details (R)	ACTUAL AMOUNT 2019 (R)	BUDGETED AMOUNT 2020 (R)	ACTUAL AMOUNT 2020 (R)
School fees	500 000	500 000	300 000
Grant from National Government	143 500	143 500	71 750
Tuckshop sales (income)	7 000	7 000	3 000
TOTAL	650 500	650 500	-----
EXPENSES	ACTUAL AMOUNT 2019 (R)	BUDGETED AMOUNT 2020 (R)	ACTUAL AMOUNT 2020 (R)
Salaries and wages	229 650	229 650	197 000
Teaching and learning resources	209 737,50	240 000	218 856
Administration	35 000	38 000	21 300
Feeding	75 000	80 000	45 900
Maintaining infrastructure	12 000	8 000	4 720,50
TOTAL	561 387,50	595 650	487 776,50
		BUDGETED AMOUNT (R)	ACTUAL AMOUNT (R)
NET INCOME		54 850	- 113 026,50

1.4

TABLE 3 below shows the provincial results in Mathematical Literacy in the National Senior Certificate (NSC) Examinations in 2021. A candidate must achieve 30% or above to pass.

TABLE 3: SHOWING PROVINCIAL RESULTS IN MATHEMATICAL LITERACY IN 2021

PROVINCE NAME	TOTAL WROTE	% ACHIEVED AT 30% AND ABOVE
Eastern Cape	46 960	72,3
Free State	21 450	85,8
Gauteng	87 381	82,6
KwaZulu-Natal	105 651	68,6
Limpopo	59 560	67,2
Mpumalanga	37 857	71,5
North West	30 125	77,6
Northern Cape	9 813	71,3
Western Cape	42 270	80,4
National (RSA)	-----	74,5

[Source: [https://education.gov.za/release of NSC results 2021](https://education.gov.za/release%20of%20NSC%20results%202021)]

NOTE:

- Pass is 30% and more
- Fail is any mark below 30%

Use TABLE 3 to answer the questions that follow.

- 1.4.1 Determine the total number of candidates who wrote Mathematical Literacy in 2021, in the Republic of South Africa. (2)
- 1.4.2 Determine the number of provinces that performed poorer than the national score in 2021 in terms of an achievement of 30% and above. (2)
- 1.4.3 Calculate the number of candidates who passed Mathematical Literacy in the Eastern Cape in 2021. (3)
- 1.4.4 Determine the probability of randomly selecting a candidate that failed Mathematical Literacy in 2021, from those that wrote the subject in the Northern Cape. (2)

Activity 2

LEVEL 1-2 QUESTIONS{ALL LEVEL 1}

1.1 TABLE 1 below shows the fees charged at Marie Secondary School.

TABLE 1: SCHOOL AND HOSTEL FEES FOR 2020

Account holder
Katleho Titus

Account for the year is payable on 1 February.
Arrangement for quarterly or monthly (over 11 months) payments can be made.

School Fees

Date	Description	Debit	Credit
01/01/2020	Balance brought forward		R32,55
06/01/2020	School fees 2020	R12 540,00	
13/01/2020	EFT bank deposit		R3 135,00
03/04/2020	EFT bank deposit		R3 135,00
10/07/2020	EFT bank deposit		R3 135,00
30/10/2020	EFT bank deposit		R3 135,00

Hostel Fees

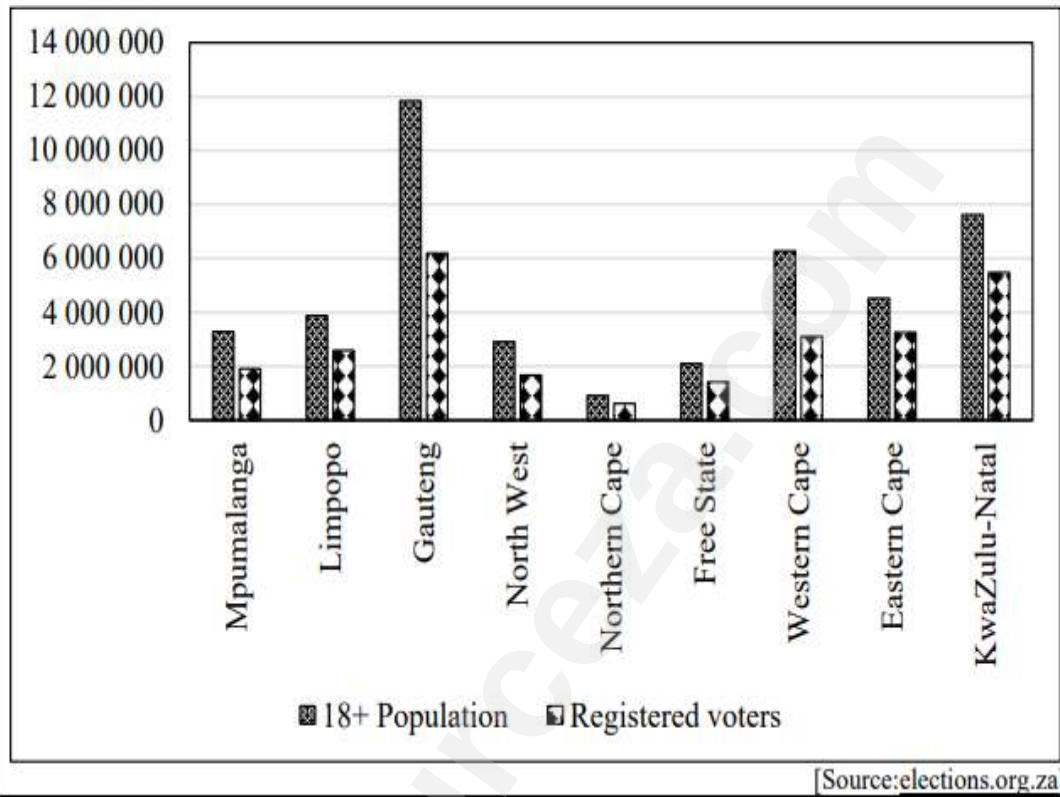
Date	Description	Debit	Credit
01/01/2020	Balance brought forward		R00,00
06/01/2020	Hostel fees 2020	R20 350,00	
13/01/2020	EFT bank deposit		R5 100,00
03/04/2020	Hostel cancelled		R15 250,00
01/12/2020	Total due		R00,00

[Adapted from actual school statement]

Use TABLE 1 above to answer the questions that follow.

- 1.1.1 Explain the meaning of the term *debit* in this context. (2)
- 1.1.2 Write down the frequency of the school fee payments. (2)
- 1.1.3 Identify a descriptor that indicates Katleho did not stay at home during the first three months of 2020. (2)
- 1.1.4 Determine the school fee amount to be paid if the monthly payment option was used. (3)
- 1.1.5 Calculate the total amount paid for school and hostel fees in 2020. (3)

- 1.2 The graph below indicates the number of registered voters per province for the 2021 municipal elections.



Use the graph above to answer the questions that follow.

- 1.2.1 Identify the type of graph drawn. (2)
- 1.2.2 Write down the minimum age required for voting. (2)
- 1.2.3 Determine the probability of randomly selecting a province where the number of registered voters is higher than the voting population. (2)
- 1.2.4 Express the number 5 471 539 in words. (2)
- 1.2.5 Write down the number of provinces taking part in the municipal elections. (2)

1.3

Buying a cell phone is sometimes not easy as one has to compare the storage capacities and the price.

The information below indicates the prices charged for different storage capacities of the same brand of cell phone.



Capacity	Cash price
256 GB	R25 899
128 GB	R23 699
512 GB	R30 899
1 TB	R35 299

NOTE: GB stands for gigabyte
TB stands for terabyte
1000 GB = 1TB

Study the information above to answer the questions that follow.

1.3.1 Write down the cash price of a cell phone with the lowest capacity. (2)

1.3.2 Arrange the cell phone capacity in descending order. (2)

1.3.3 Determine the price difference between a 512 GB and a 256 GB cell phone. (2)

1.3.4 Round R23 699 to the nearest thousand rands. (2)

[30]

Activity 3

LEVEL 1-2 QUESTIONS{ALL LEVEL 1}

- 1.1 Thato has a bank account with Capitec Bank. Study the bank statement in the table below, and answer the questions that follow.

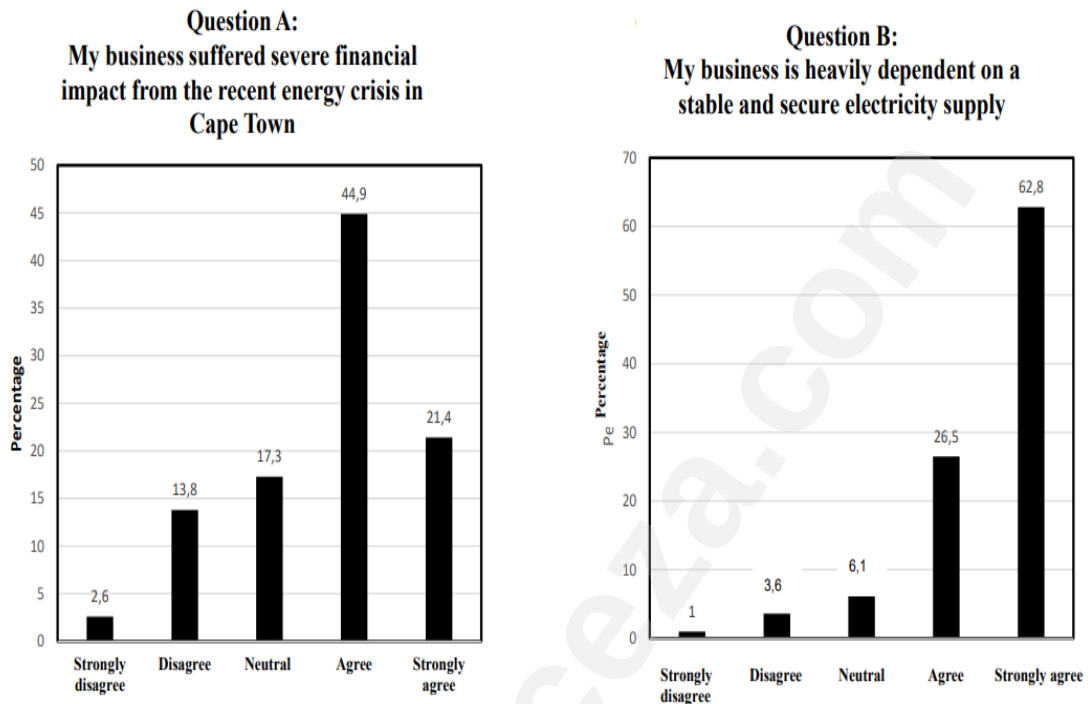
Table 1: Thato's bank statement

Date	Description	Debit (R)	Credit (R)	Balance (R)
19/04	Balance brought forward			26 935,48
20/04	Cash Deposit		2 450	29 385,48
	Service fee	12,25		29 373,23
21/04	Debit order: King Price Insurance	1 250		A
	Service fee	5,00		28 118,23
23/04	Stop order: Discovery Medical Aid	5 927		22 191,23
	Service fee	5,00		22 186,23
25/04	Deposit: Salary		B	54 708,48
	Service fee	32,52		54 675,96
29/04	Debit card: Checkers	7 332,45		47 343,51
	Service fee	3,50		47 340,01
01/05	Bond payment	14 500		32 840,01
	Service fee	21,75		32 818,26
01/05	Wesbank: Car payment	6 500		26 318,26
	Service fee	7,00		26 311,26
01/05	Truworths account	2 250		24 061,26
	Service fee	2,75		24 058,51

- 1.1.1 Calculate the value of **A** in the bank statement. (2)
- 1.1.2 Calculate the value of **B** in the bank statement. (2)
- 1.1.3 Write down Thato's bank balance on 19 April in words. (2)
- 1.1.4 Identify the service fee that was charged on the bond payment. (2)
- 1.1.5 Calculate the number of days from 15 April until 14 May. (2)
- 1.1.6 Define the term *debit order*. (2)
- 1.1.7 Show how the balance of R29 385,48 (on 20 April) was calculated. (2)
- 1.1.8 With which bank does Thato conduct his banking? (2)

ANNEXURE A

QUESTION 1.2



- 1.2 Load shedding has affected many households and businesses in our country. Some of the businesses in the country were asked how they were impacted by electricity shortages during this time. Refer to ANNEXURE A, which has responses to questions asked to business owners, and answer the questions that follow.
- 1.2.1 State the difference between *discrete data* and *continuous data*. (2)
- 1.2.2 Determine the mode of the data provided in QUESTION A (Annexure A). (2)
- 1.2.3 Determine the difference between the percentages of businesses that remained neutral for QUESTION A and for QUESTION B (Annexure A). (2)
- 1.2.4 Identify the highest percentage from the data in QUESTION A (Annexure A). (2)
- 1.2.5 Name the city where this survey was conducted. (2)
- 1.2.6 What percentage strongly agreed that their businesses are heavily dependent on a stable and secure electricity supply? (2)
- 1.2.7 Arrange the data in QUESTION A (Annexure A) in descending order. (2)

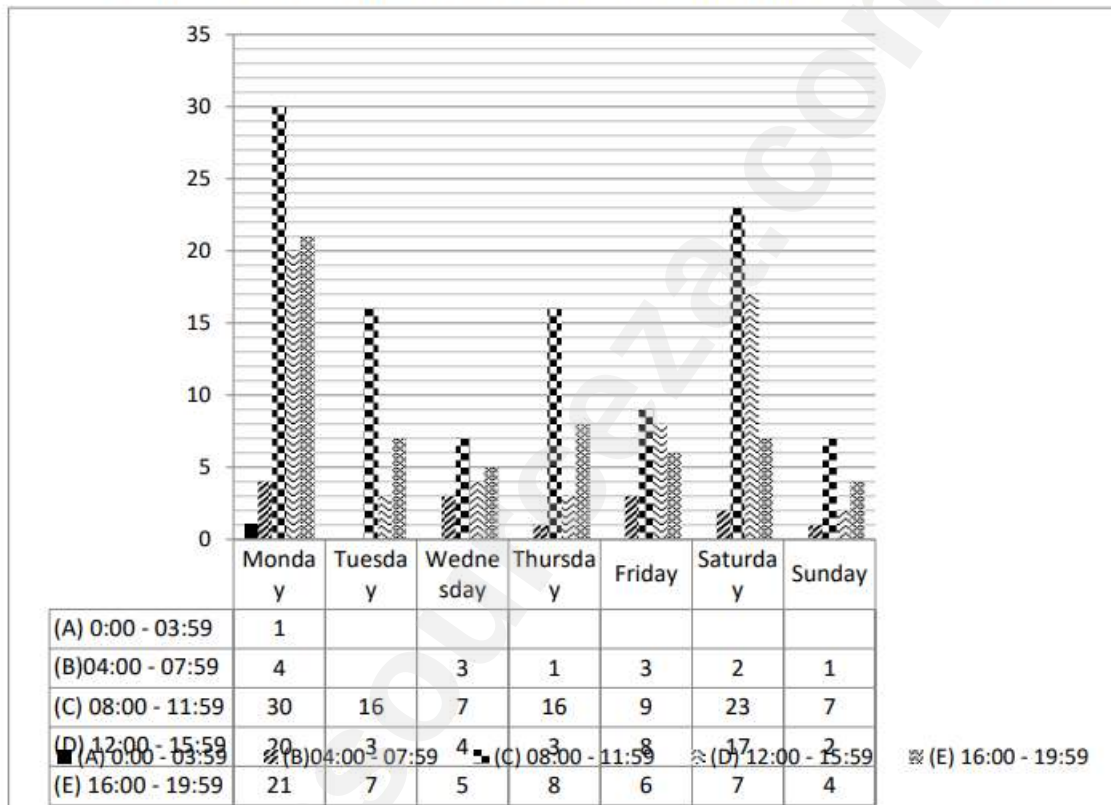
[30]

Activity 4

LEVEL 1-2 QUESTIONS{ALL LEVEL 1}

1. Cash-in-transit robberies are a serious problem in South Africa. The graph below shows the days and times when robberies are committed.

ROBBERY OF CASH-IN-TRANSIT: DAYS AND TIMES OF THE WEEK



Source: [www.businesstech.co.za]

Use the graph and the table above to answer the questions that follow.

- 1.1.1 Identify which day of the week had the greatest number of robberies. (2)
- 1.1.2 Calculate the total number of robberies that occurred on Saturday. (2)
- 1.1.3 Determine how many robberies occurred from 8:00 – 11:59 on Thursday. (2)
- 1.1.4 Calculate the difference between the highest and the lowest number of robberies that occurred on a Monday. (2)
- 1.1.5 Write down the time interval that had the highest number of robberies throughout the week. (2)

NSC

1.2

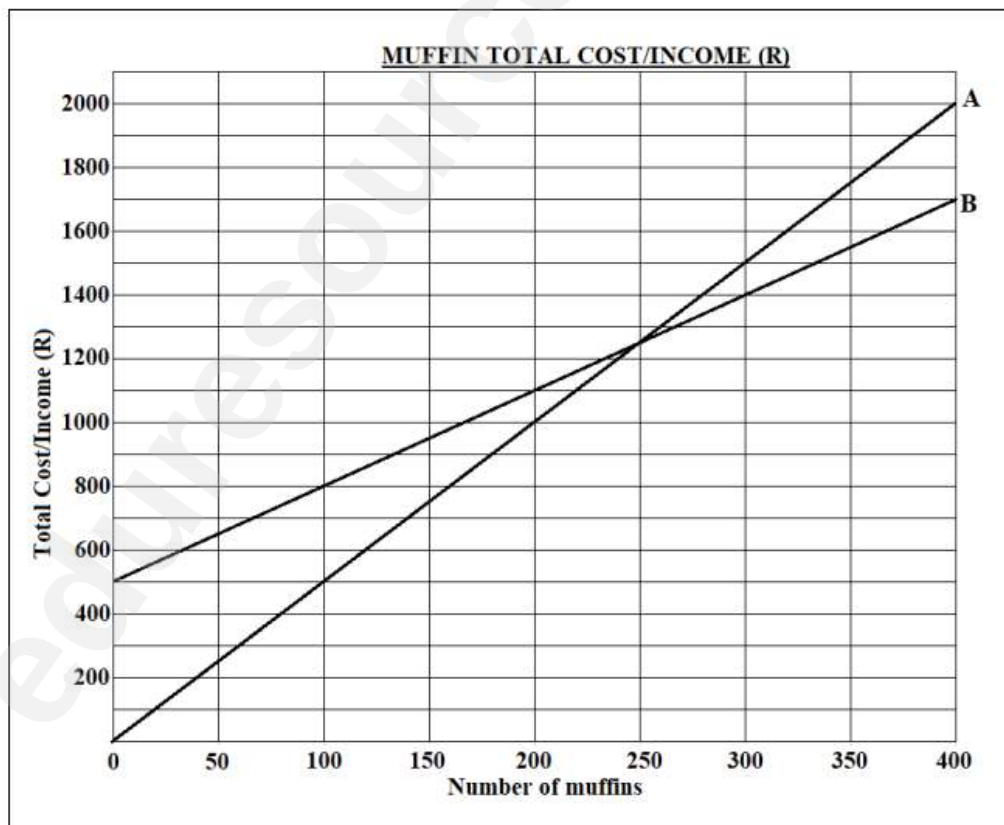
The School Governing Body of Green Fields High School approved 2022 annual school fees of R17 500 which includes a 10% increase from 2021 school fees. If the annual fees are paid by March 2022 there will be a discount equivalent to the percentage increase in the school fees.

Use the information above to answer the questions that follow.

- 1.2.1 Write down the percentage discount given to those who fully paid the school fees in March. (2)
- 1.2.2 Calculate the annual school fees for 2021 rounded off to the nearest R1. (2)
- 1.2.3 Lerumo's parents chose the ten equal monthly payments option in 2022. Calculate their monthly payment. (2)
- 1.2.4 If the 2021 school fees was R15 909 and increased to R17 500 in 2022, calculate the increase in the school fees. (2)

1.3

Green Fields High School Matric Dance Committee bakes and sells muffins to raise funds for the matric dance. Given below is the graph for total cost and total income for the muffins.



Use the graph above to answer the questions that follow.

- 1.3.1 Explain the meaning of the word “*total cost*” in the context above. (2)
- 1.3.2 State what each of the line graphs **A** and **B** represent. (2)
- 1.3.3 Write down the fixed cost. (2)
- 1.3.4 Determine the cost for baking 300 muffins. (2)
- 1.3.5 Calculate the selling price for each muffin. (2)
- 1.3.6 Write down the number of muffins to be sold to break-even. (2)
- [30]**

Activity 5

LEVEL 1-2 QUESTIONS{ALL LEVEL 1}

- 1.1 The St Petersburg Ballet Theatre is a ballet group that performs around the world. Christine bought tickets online from Computicket to watch the Swan Lake performance.

TABLE 1: TICKET CONFIRMATION FOR THE SWAN LAKE PERFORMANCE

 The ticket you can't forget		DATE OF PURCHASE 12 May 2022 20:13	
EVENT Swan Lake – St Petersburg Ballet Group		VENUE The Teatro at Montecasino	
EVENT DATE 24 July 2022, Sunday at 14:00		NUMBER OF TICKETS 7	
SEATS X23 – X29		TOTAL COST R3 220,00	
ADDITIONAL INFORMATION: Age restriction: • No under 3 years • No babies in arms Duration of performance: • Act 1: 65 minutes • Interval: 20 minutes • Act 2: 35 minutes • Interval: 15 minutes • Act 3: 22 minutes			

[Adapted from source: tickets.computickets.com]

Use TABLE 1 to answer the questions that follow.

- 1.1.1 Write down the time that Christine purchased the tickets. (2)
- 1.1.2 Write down the name of the venue where the performance will be hosted. (2)
- 1.1.3 Calculate the cost of 1 ticket. (3)

NSC

1.2

The table below shows data of different animals regarding their heart rate and the weight of their hearts.

TABLE 2: THE AVERAGE HEART RATE AND AVERAGE HEART WEIGHT OF DIFFERENT ANIMALS.

ANIMAL	AVERAGE HEART RATE (beats per minute)	AVERAGE HEART WEIGHT (gram)
Horse	34	6 400
Giraffe	150	11 000
Hummingbird	1 000	1,588
Pig	80	302
Rabbit	135	6,69
Sheep	75	147
Pygmy shrew	1 300	0,479
Blue whale	9	180 000
Cow	66	2 200
Cat	180	20
Elephant	30	16 500

[Source: <https://iloveveterinary.com/blog/animal-heart-rates/>]

Use TABLE 2 to answer the questions that follow.

- 1.2.1 Identify the animal in the table with the third fastest heart rate. (2)
- 1.2.2 Arrange, in descending order, the average heart weight of the animals. (2)
- 1.2.3 Write down (in simplified form) the ratio of the heart rate of a pygmy shrew to the heart rate of a rabbit. (2)
- 1.2.4 Calculate the difference between the average heart weight of a blue whale and a horse. (2)
- 1.2.5 State whether the average heart rate data is discrete or continuous. (2)
- 1.2.6 The probability of randomly selecting an animal in the table with an average heart rate of less than 70 beats per minute is $\frac{4}{11}$.
Write this probability in decimal form rounded to THREE decimal places. (2)
- 1.2.7 Write down the modal average heart rate of the animals in TABLE 2. (2)

NSC

- 1.3 Mbombela High School is having their annual prize giving function. Mrs Reynold bought trophies for this function and received the following invoice.

TABLE 3: THE TAX INVOICE FOR TROPHIES ORDERED.

		TROPHIES GALOREcc		TAX INVOICE	
PO Box 111, Nelspruit, 1200					
Shop 22, Village Park					
Cell: 066 2143 879					
TO: Mbombela High School				Date: 10 October 2021	
Mrs Reynold					
Quantity	Description			Unit price	Amount
A	Wooden trophies with 2 brandings			150,00	2 400,00
1	92 mm × 92 mm Engraving			65,00	65,00
6	80 mm × 20 mm Sublimation plate			B	270,00
6	50 mm × 15 mm Sublimation plate			35,00	210,00
SUB TOTAL					2 945,00
VAT					441,75
TOTAL					3 386,75

Terms: Strictly 30 days

[Adapted from source: Nel trophies invoice]

Use TABLE 3 to answer the questions that follow.

- 1.3.1 Write down the name of the company where Mbombela High School ordered the trophies. (2)
- 1.3.2 Calculate the missing value **A** (the quantity of wooden trophies) that was ordered. (2)
- 1.3.3 Calculate the missing value **B** (the unit price) of the 80 mm × 20 mm sublimation plate. (2)
- 1.3.4 Mrs Reynold decided to cancel all the 50 mm × 15mm sublimation plates from the order.
Determine the new SUB TOTAL on the invoice after the cancellation. (2)

[29]

QUESTION 6 [MAPS AND PLANS]

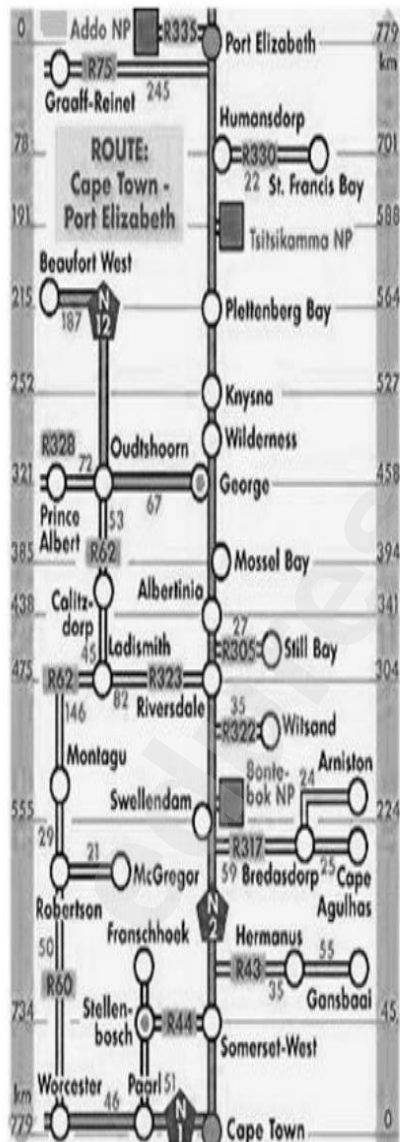
Activity 1

LEVEL 1-2 QUESTIONS{2.1.1 , 2.1.3a , 2.1.3b , 2.2.1 , 2.2.3 , 2.2.5}

ANNEXURE A

QUESTION 2.1

MAP OF THE ROUTE BETWEEN CAPE TOWN AND PORT ELIZABETH



[Source: <https://docplayer.net/>]

DISTANCE TABLE SHOWING DISTANCES BETWEEN VARIOUS TOWNS/CITIES

	Colesberg	Durban	East London	George	Graaff-Reinet	Grahamstown	Johannesburg	Kimberley	Nelspruit	Oudtshoorn	Port Elizabeth	Pretoria	Springbok	Beaufort West	Bloemfontein	Cape Town
Colesberg	881															
Durban	518	667														
East London	545	1240	630													
George	203	645	3838	342												
Graaff-Reinet	370	796	185	461	274											
Grahamstown	623	598	992	1168	826	987										
Johannesburg	284	842	750	734	501	654	467									
Kimberley	964	689	1214	1509	1167	1242	358	832								
Nelspruit	495	1244	686	63	312	479	1130	676	1472							
Oudtshoorn	454	927	300	330	251	131	1062	752	1373	358						
Port Elizabeth	681	656	1050	1226	895	1045	58	532	342	1188	1119					
Pretoria	857	1642	788	846	911	1185	1274	800	1543	788	1289	1200				
Springbok	316	1225	597	237	209	483	951	497	1293	179	405	1009	741			
Beaufort West	219	667	575	764	422	570	417	175	771	714	635	475	975	535		
Bloemfontein	779	1660	1042	436	672	873	1405	960	1779	422	756	1463	554	463	998	
Cape Town																

[Source: <https://colesberginfo.co.za/>]

- 2.1 Thembi stays in Cape Town. She wants to visit the Addo National Park (NP) near Port Elizabeth for her holidays. ANNEXURE A shows a map with the route from Cape Town to Port Elizabeth and the distance table, which shows the distances between some of the towns on route from Cape Town to Port Elizabeth.

Use the information in ANNEXURE A to answer the questions that follow.

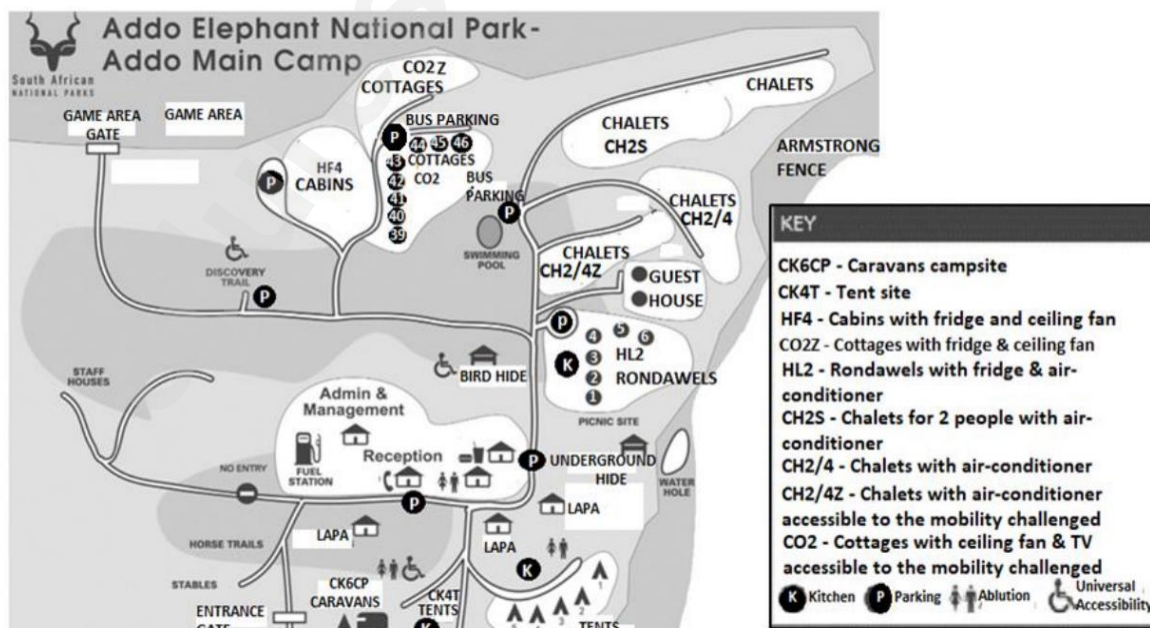
- 2.1.1 What do we call the type of map shown in ANNEXURE A? (2)
- 2.1.2 On the map in ANNEXURE A, the distance between Humansdorp and St. Francis Bay is given as 22 km. This distance on the map looks much larger than the distance between Hermanus and Gansbaai, which is given as 55 km via the R43. Give a reason why the 22 km on the map looks larger than the 55 km on the map. (2)
- 2.1.3 The road distance between Port Elizabeth and the Addo National Park is 68,5 km.
- (a) Determine the distance between Cape Town and the Addo National Park if the shortest route is used. (3)
- (b) What roads will Thembi use to travel from Cape Town to Addo National Park if she uses the shortest route? (4)
- (c) Thembi plans to stop every time after travelling at least 200 km. Write down the names of the towns or cities where she will stop. (3)
- 2.1.4 Thembi decides to visit her grandmother in Oudtshoorn on route to the Addo National Park. Thembi calculates the distance from Cape Town to Oudtshoorn using the map on ANNEXURE A and then use the distance table on the same ANNEXURE to verify the distance. She remarks that there is a difference of 103 km between the distance on the map and the distance chart on ANNEXURE A. Verify if Thembi calculated the difference correctly and give a reason for this difference in the distance between the two towns. (7)

- 2.2 Thembi is travelling with her mother, who has a physical disability, and her younger sister. ANNEXURE B shows the layout of the main camp of the Addo National Park, the Addo camp.

Use the information above and ANNEXURE B and answer the questions that follow.

- 2.2.1 Thembi books cottage number 46 to stay in during the holiday. Give a reason why cottage number 46 will suit Thembi and her family's special needs. (2)
- 2.2.2 Thembi gets into her car at cottage number 46. She travels on the road between areas HF4 and CO2 in the direction of cottage 39. She then follows the single road until she comes to the road which leads to the game area. Here Thembi turns left and travels on with the road. What attraction will she find on her right as she keeps on travelling on the road before she comes to a T-junction? (3)
- 2.2.3 How many RONDAWELS are there with a fridge and an air conditioner? (2)
- 2.2.4 Why is it important that there should be a kitchen available near the tent site? (2)
- 2.2.5 What is the probability of finding parking areas for buses out of all the parking areas on the layout plan? Give your answer as a percentage rounded to two decimal places. (3)
- [33]

LAYOUT OF THE ADDO NATIONAL PARK – ADDO MAIN CAMP



[Source: adapted from mobilemaplets.com]

Activity 2

LEVEL 1-2 QUESTIONS{2.1.1 , 2.2.1 , 2.2.2 , 2.2.3 , 2.2.5 , 2.2.6 , 2.2.8 , 2.2.9}

- 2.1 The *Royal Mail Ship St Helena* was a unique cargo-passenger ship built in 1989, specifically to supply the Island of St Helena, a British overseas territory in the tropical South Atlantic Ocean. The *Royal Mail Ship St Helena* can accommodate 156 passengers and 56 crew members.



Study the information and the map above, and answer the following questions.

- 2.1.1 Determine the probability that if a person could be picked at random from the ship, it would be a crew member. Give the answer as a percentage. (3)
- 2.1.2 The passengers on the *Royal Mail Ship St Helena* are of the following nationalities:

Nationality	Number of passengers	Male	Female
South African	48	35	13
Russian	12	8	4
American	56	23	33
German	23	10	13

Determine the probability that if a passenger is selected at random, the passenger will be a Russian, male passenger or a South African, female passenger. (4)

2.2 The *Royal Mail Ship St Helena* departs from Cape Town to St Helena. Study the map of St Helena in ANNEXURE A and answer the questions that follow.

2.2.1 Where is the harbour on St Helena likely situated? (2)

2.2.2 Choose the correct letter that will make the following statement TRUE.

The town of Levelwood lies:

- A South of Longwood
 - B West of Blue Hill
 - C South-west of Jamestown
- (2)

2.2.3 What type of scale is shown in ANNEXURE A? (2)

2.2.4 Use the scale on the map to determine the distance, as the crow flies, from Longwood (the town) to St Paul's (the town). Give the answer in kilometres.

NOTE: 1 mile = 1,60934 km. (4)

2.2.5 Give ONE reason why certain towns on the map are indicated with larger dots than other towns on the map. (2)

2.2.6 Use a ruler to measure the approximate length, as the crow flies, of St Helena from the most south westerly end to the most north easterly part of the island. Give the answer in cm. (2)

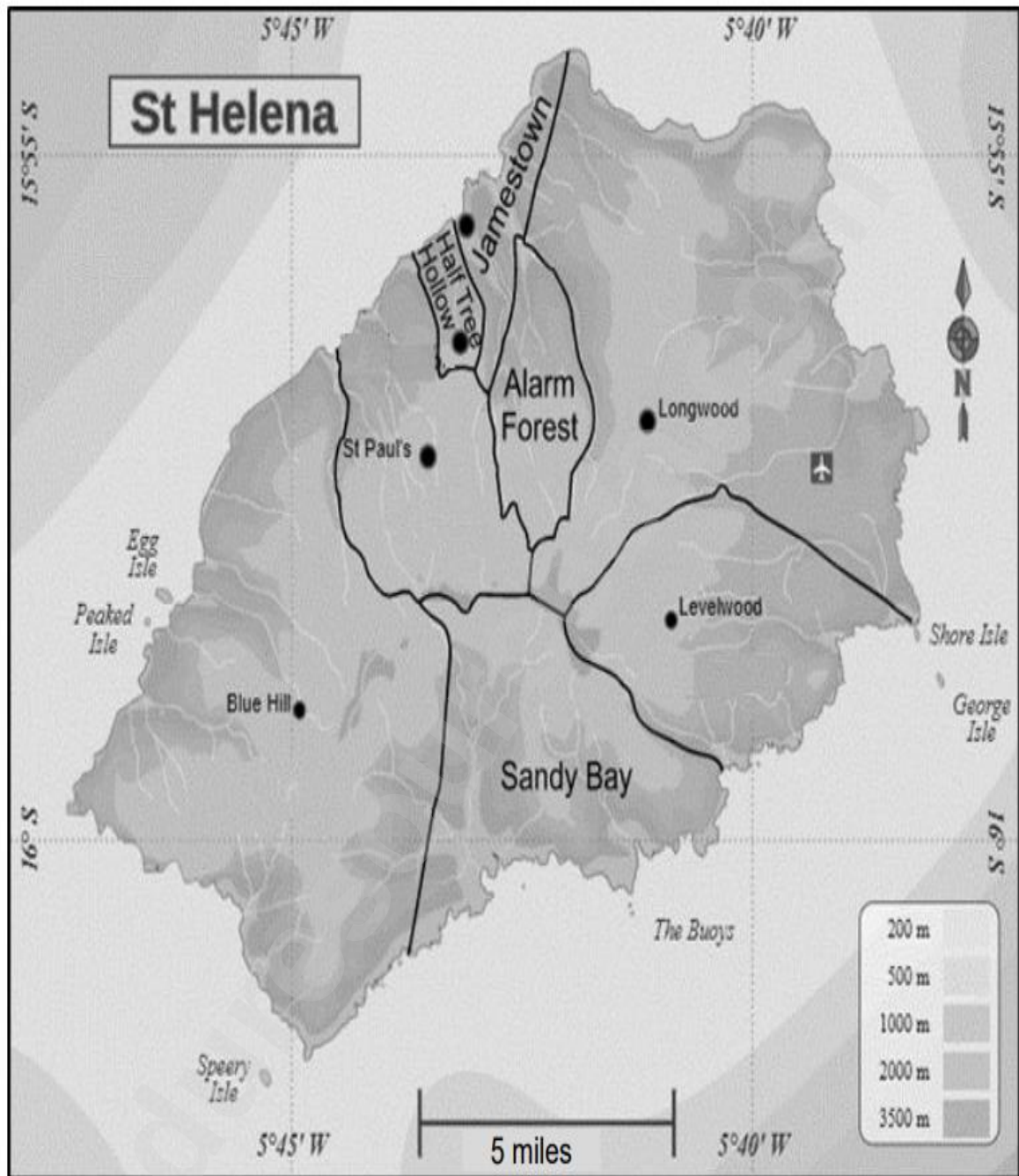
2.2.7 The maximum breadth of the island is approximately 10 km. Use the scale of the map together with the answer to QUESTION 2.2.6 to determine the estimated area of the entire island. (4)

2.2.8 Population density is the number of people found living in each square kilometre of an area. According to the last census in 2016 there were 4 534 people living on St Helena. Use the answer to QUESTION 2.2.7 to determine the population density of St Helena. (3)

2.2.9 If you had the opportunity to start a business on St Helena, what type of business would it be? (2)

[30]

ANNEXURE A: QUESTION 2.2



[Source: [https://en.wikipedia.org/wiki/File:Districts of St Helena.svg](https://en.wikipedia.org/wiki/File:Districts_of_St_Helena.svg)]

Activity 3

LEVEL 1-2 QUESTIONS{2.1.1 , 2.1.2 , 2.1.3 , 2.1.4 , 2.1.5 , 2.2.1 , 2.2.2 , 2.2.3}

2.1

Shown in ANNEXURE A is the floorplan of a house with 3 bedrooms and 2 bathrooms.

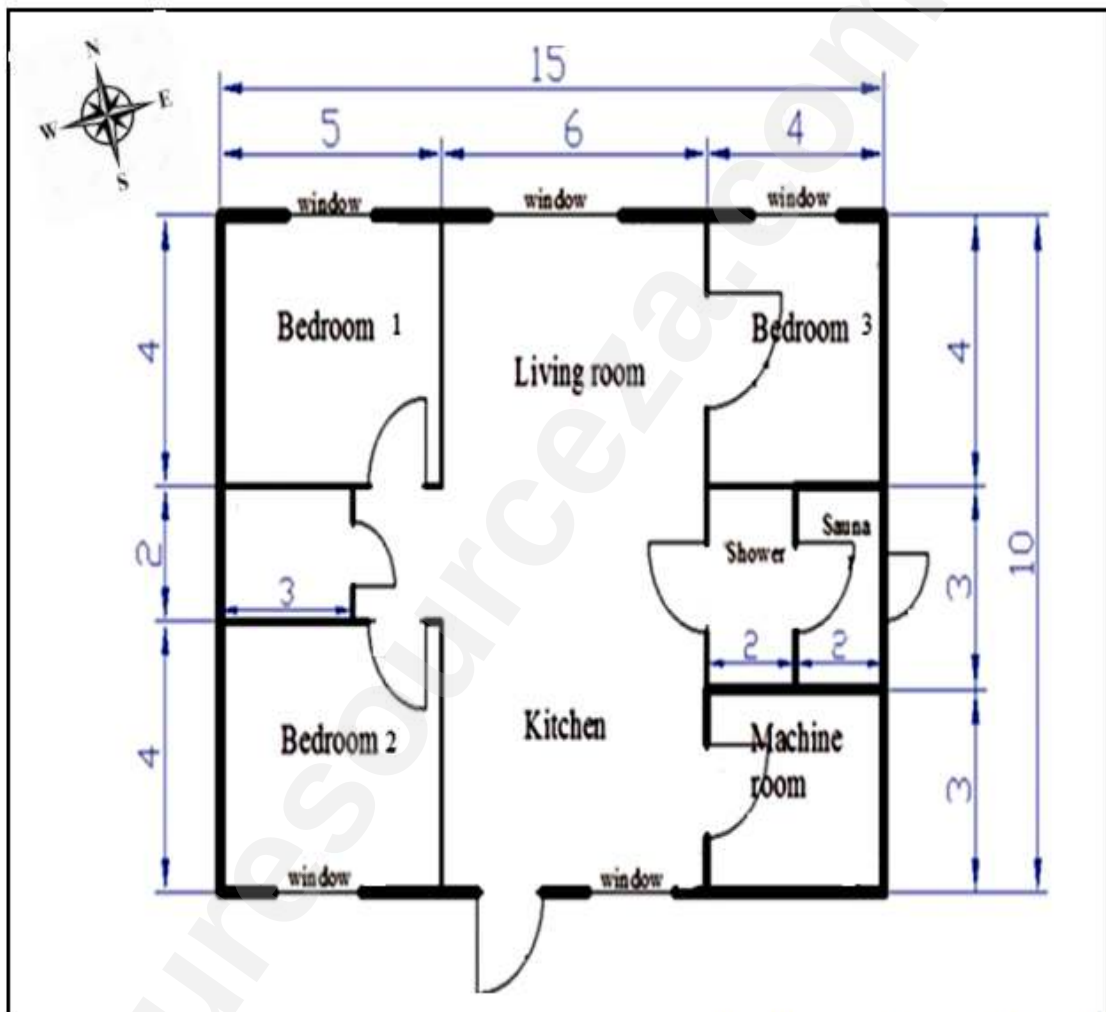
Use the floorplan in ANNEXURE A to answer the following questions.

- 2.1.1 Determine how windows and doors can be seen on this floor plan. (2)
- 2.1.2 In which general direction does the living room window face? (2)
- 2.1.3 Determine which bedroom will get the morning sun. (2)
- 2.1.4 Identify one design error on this floorplan. (2)
- 2.1.5 Name the type of plan that will show the side views of the house. (2)
- 2.1.6 Name ONE difference between the floorplan in ANNEXURE A and the type of plan in question **2.1.5** above. (2)

ANNEXURE A

QUESTION 2

FLOORPLAN OF A HOUSE



[Source:www.researchgate.net]

Scale 1:100

Key:



2.2

The scale on the floorplan is 1 :100. The dimensions of the house are given in metres.

2.2.1 Explain the meaning of the scale 1:100 in words. (2)

2.2.2 Use the scale of 1:100 to determine the drawing size of the length of the machine room. (3)

2.2.3 A statement was made that the scale given above is not very accurate if the floorplan is resized.

Is this statement correct? Give a reason for your answer. (3)

[20]

Activity 4

LEVEL 1-2 QUESTIONS{2.1.2 , 2.1.4 , 2.2.1 , 2.2.2 , 2.2.3 , 2.2.4 , 2.4.1 , 2.4.2 , 2.4.3 , 2.4.4}

2.1

The 16 best men's cricket teams took part in the International Cricket Council (ICC) 2020 T20 World Cup held in the United Arab Emirates and Oman from 17 Oct 2021 to 14 November 2021. The tournament would have taken place in Australia during 2020, but was postponed to 2021 due to the Covid-19 pandemic.

Six of the cricket coaches at Victoria Heights Primary School, situated in Dubai, decided to take each of their teams to watch the match between Australia and England at the Dubai International Cricket Stadium.

ANNEXURE B shows a map of the Dubai International Cricket Stadium and the surrounding area.

NOTE:

- The match took place on the 30th of October 2021.
- The stadium has a capacity of 25 000.
- There are 11 players in a cricket team.
- Assume there are no reserves in their school teams.



[Source: <https://www.t20worldcup.com/>]

Use the information above and ANNEXURE B to answer the questions that follow.

2.1.1 The coaches took the cricket players to a restaurant, Zay Zaman for supper after the match. The group faced Symphony Tower 3 when they left the stadium after the match. They took the following route (A) to the restaurant:

- Turn right after leaving the stadium.
- Turn right into Sheik Mohammed Bin Zayed Rd.
- Turn right into Hessa Street.
- Turn left into Turin Boulevard Road.
- Their destination is on the left-hand side at the next intersection.

An alternative route (B) would have been:

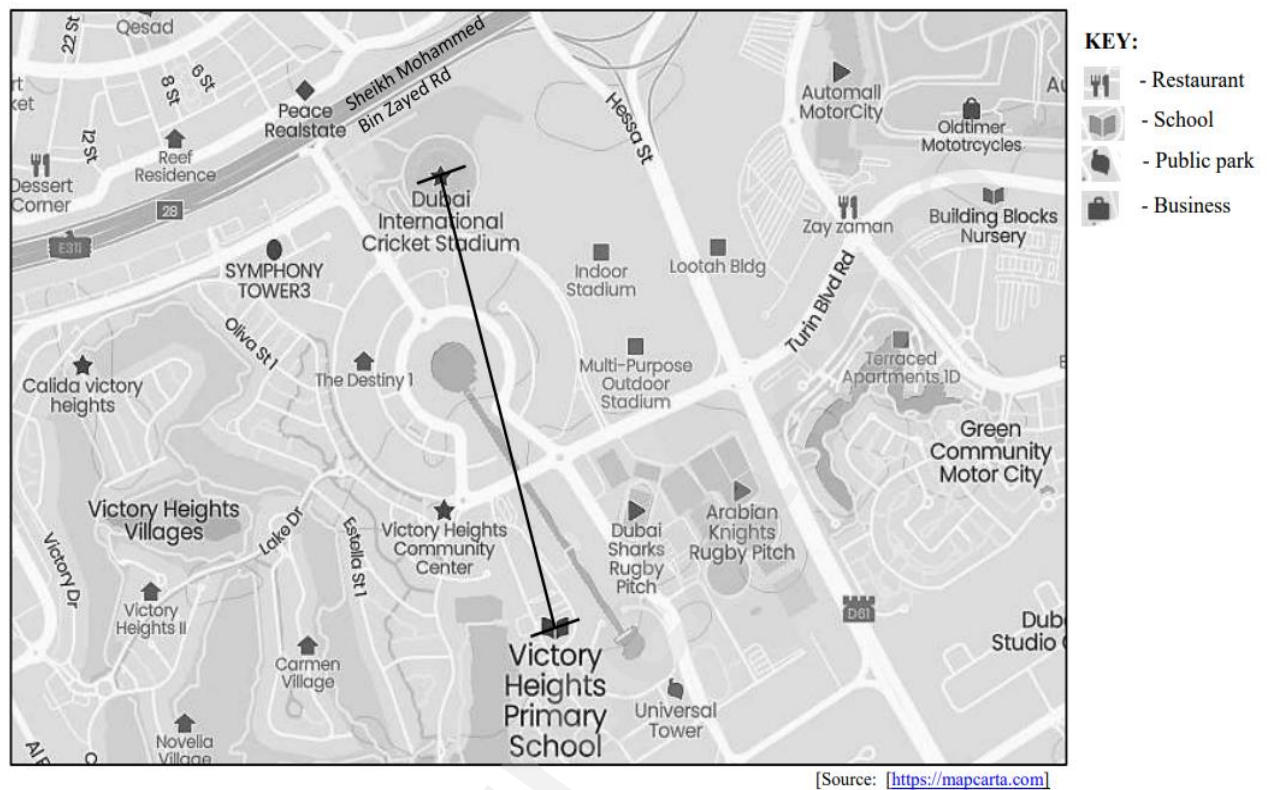
- Turn left after leaving the stadium.
- Turn left at Victory Heights Community Centre into Turin Boulevard Rd.
- Their destination is on the left-hand side at the third intersection.

Estimate which of the two, A or B, is the shortest route.

(2)

ANNEXURE B: MAP OF THE DUBAI INTERNATIONAL CRICKET STADIUM AND THE SURROUNDING AREA

QUESTION 2.1



2.1.2 Write down the number of people that can be seated in the Dubai International Cricket Stadium. (2)

2.1.3 Determine (as a decimal value, rounded to 4 decimal places) the probability of the group getting tickets for the match. (5)

2.1.4 Identify the business across the street from the Building Blocks Nursery. (2)

2.1.5 Determine the scale (to the nearest 10) of the map if Victoria Heights Primary School is 2,1 km from Dubai International Cricket Stadium. Write down your answer in the form below.

1 : (4)

- 2.2 Figure skating is a very popular winter sport in America. Angelique is training to become a competitive figure skater. She performs regularly at the Greensboro Coliseum Ice Skating Rink in North Carolina, USA.

ANNEXURE C shows the seating plan of the Greensboro Coliseum Ice Skating Rink.

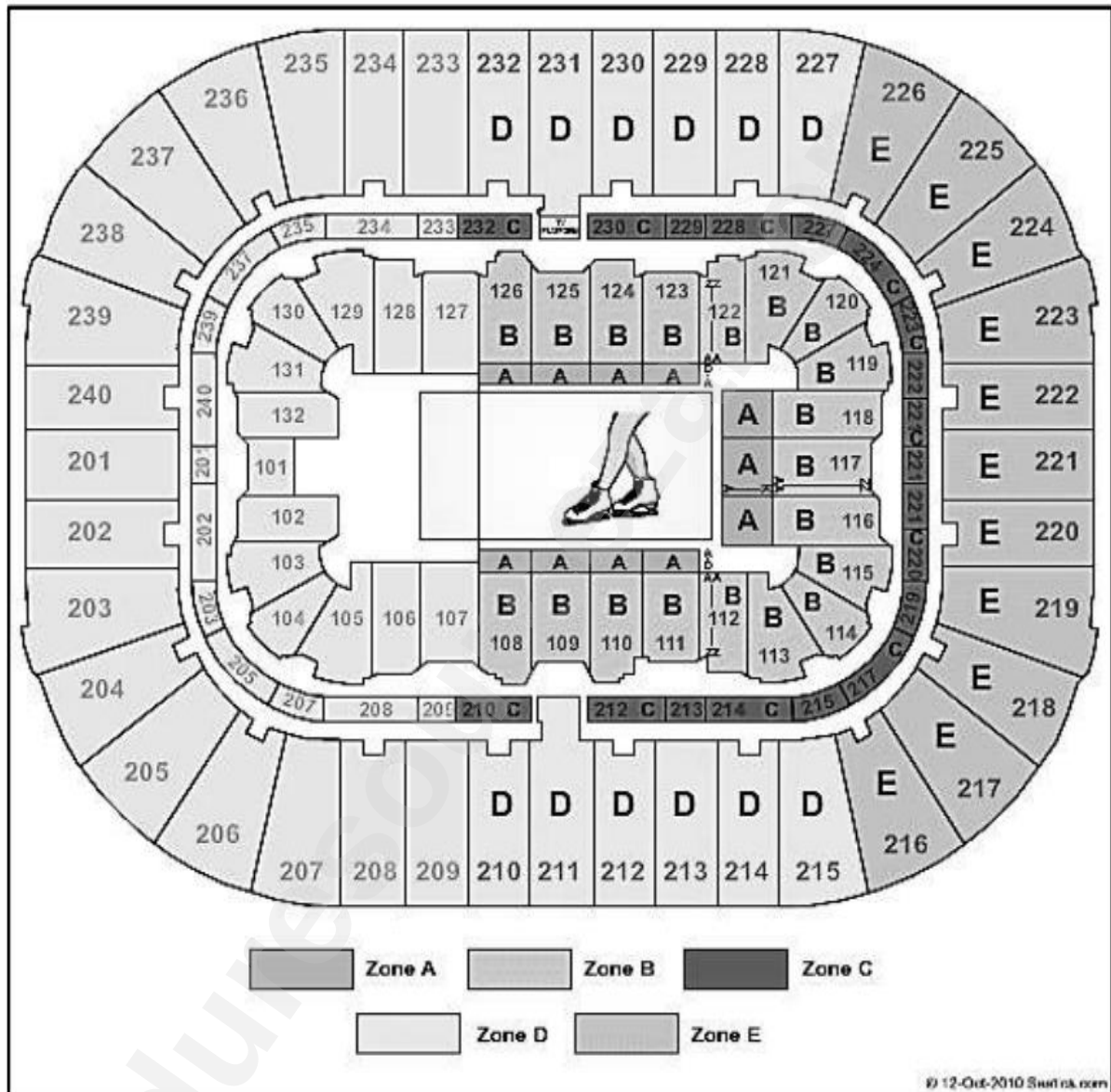


Use ANNEXURE C to answer the questions that follow.

- 2.2.1 Write down the number of zones shown on the seating plan of the ice skating rink. (2)
- 2.2.2 Identify the zone that has the least seats. (2)
- 2.2.3 Determine the zone to which the block numbers 101 to 107 belong to. (2)
- 2.2.4 Calculate the total number of blocks in Zone A and Zone B. (2)
- 2.2.5 Give ONE reason why you think Zone D tickets are the cheapest. (2)

ANNEXURE C: GREENSBORO COLISEUM ICE SKATING RINK SEATING PLAN

QUESTION 2.2



[Source: <https://www.ncskate2020.com>]

- 2.3 Angelique and her parents attended the two semi-final and the final matches of the T20 World Cup.

Angelique did not want to miss her training sessions and arranged a 3-hour practice session every day before each cricket match they attended.

The fee at Dubai Ice Rink is AED95 for an hour and a half session.

AED 1 = US\$0,27

NOTE: United Arab Emirates Dirham (AED) is the currency used in Dubai.
United States dollar (US\$) is the currency used in America.

Angelique estimated that the practice sessions will not cost her parents more than US\$150. Verify, showing all calculations, whether her estimation is VALID. (6)

- 2.4 The White House is the official residence and workplace of the president of the USA. The address is 1 600 Pennsylvania Avenue NW (north-western part of Washington, District of Columbia).

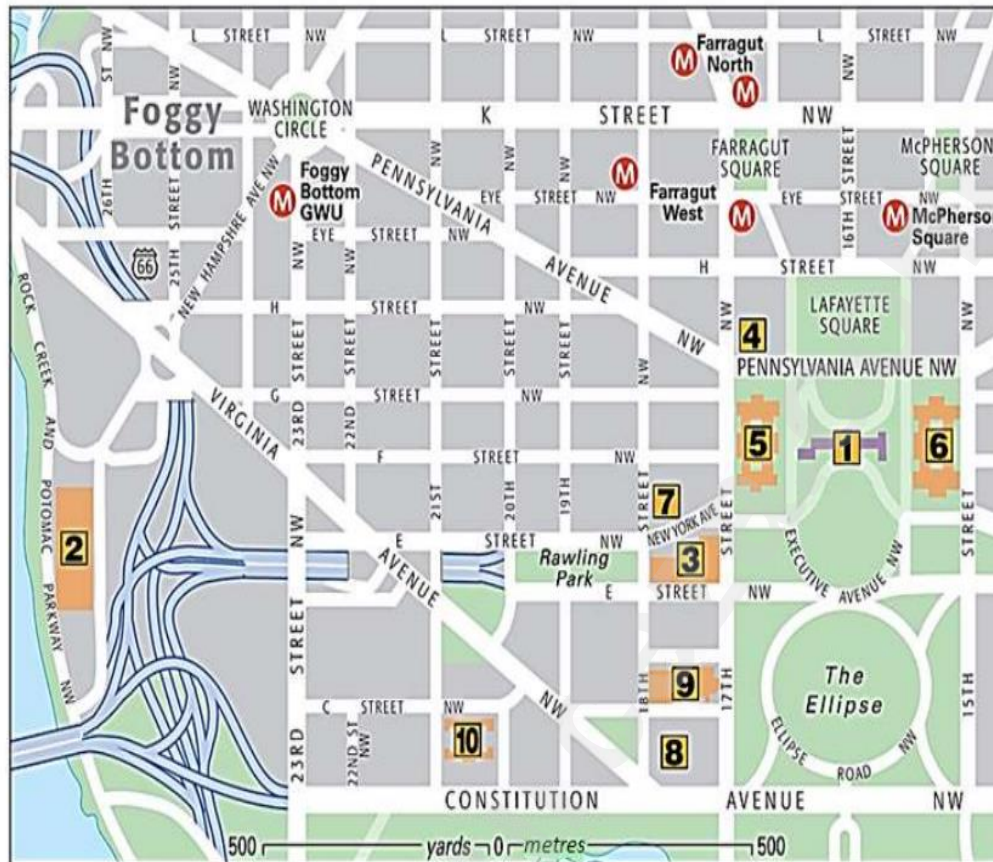
ANNEXURE D shows a street map of the area surrounding the White House.

Use ANNEXURE D to answer the questions that follow.

- 2.4.1 Write down the general compass direction of the Constitution Hall from the National Treasury. (2)
- 2.4.2 The Foggy Bottom GWU is a Metro underground train station serving the George Washington University (GWU) campus in the Foggy Bottom neighbourhood of Washington.
- Give directions to a tourist that wants to walk from the Foggy Bottom GWU Metro Underground Train Station to the White House. (4)
- 2.4.3 Measure the distance (in mm) between 15th and 23rd Street. (2)
- 2.4.4 Hence, determine the actual distance (to the nearest km) between 15th and 23rd Street if 47 mm on the map represent 500 m. (3)
- [42]

ANNEXURE D: STREET MAP OF THE AREA SURROUNDING THE WHITE HOUSE, WASHINGTON, D.C.

QUESTION 2.4



KEY:

1. White House
2. Kennedy Centre
6. National Treasury
9. Constitution Hall
10. Federal Reserve Bank

M – Metro underground
train station



[Source: <https://mom.girlstalkinsmack.com>]

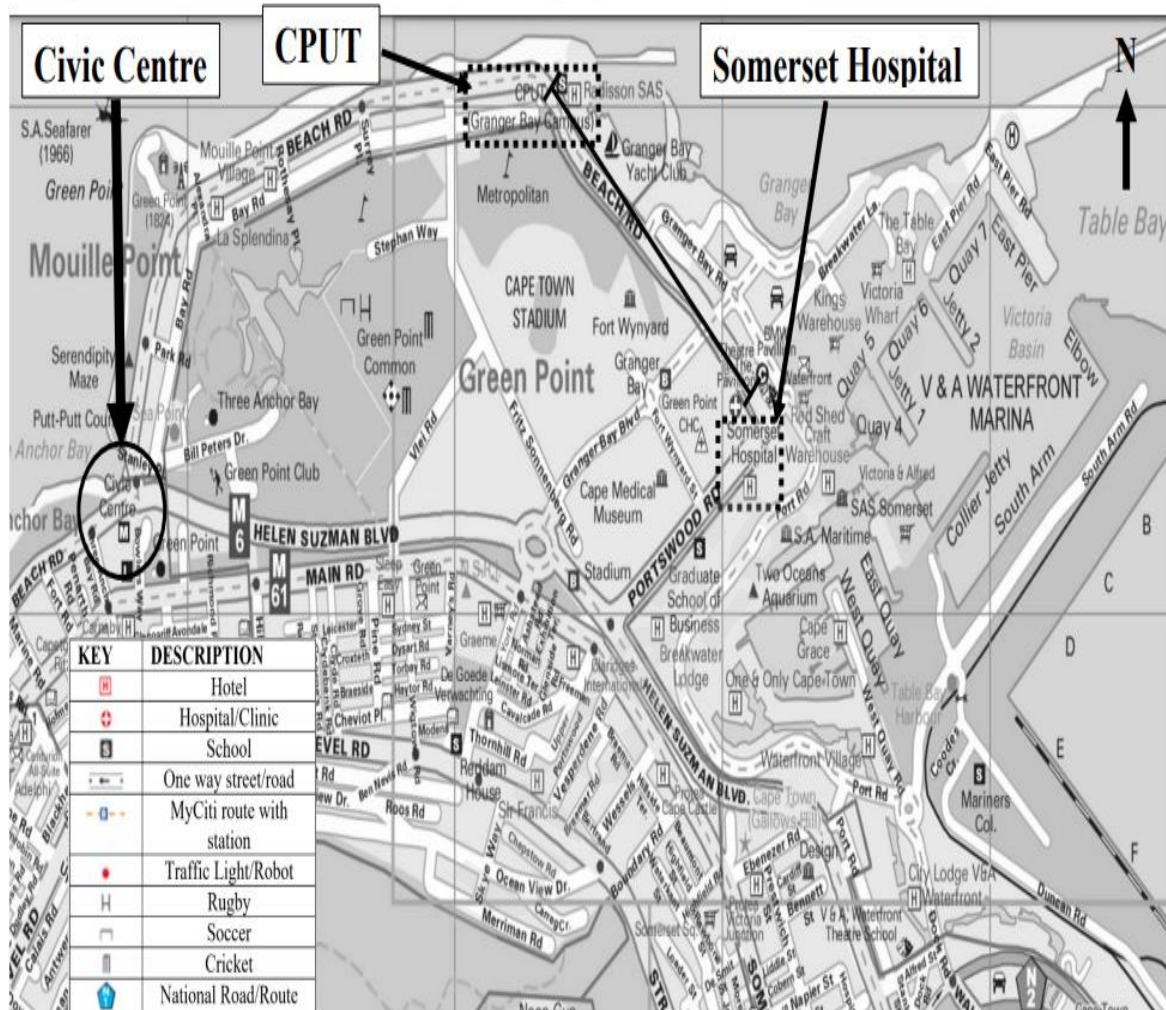
Activity 5

LEVEL 1-2 QUESTIONS{2.1.1 , 2.1.2 , 2.1.3 , 2.1.4b , 2.2.2}

- 2.1 ANNEXURE A shows the central business district (CBD) of Cape Town including a part of Sea Point. Use ANNEXURE A to answer the following questions.
- 2.1.1 Write down the type of map which shows a part of Cape Town. (2)
- 2.1.2 Write down the name of the area where a cricket field is situated. (2)
- 2.1.3 A person wants to drive from the Civic Centre to Somerset Hospital. Describe the shortest route along the M6, using the names of the streets and the directions the person needs to travel to the hospital. (4)
- 2.1.4 He walks from the campus to Somerset Hospital and back on a daily basis. He walks from Monday to Friday, but on Wednesdays he does not walk, because he needs to attend a special class.
- (a) Use the scale of the map to determine the real distance in km if the measured length between CPUT and Somerset Hospital is 6 cm. (4)
- (b) Calculate Thando's total weekly distance in km. (3)

ANNEXURE A

QUESTION 2.1 & 2.2 - CENTRAL BUSINESS DISTRICT (CBD) OF CAPE TOWN



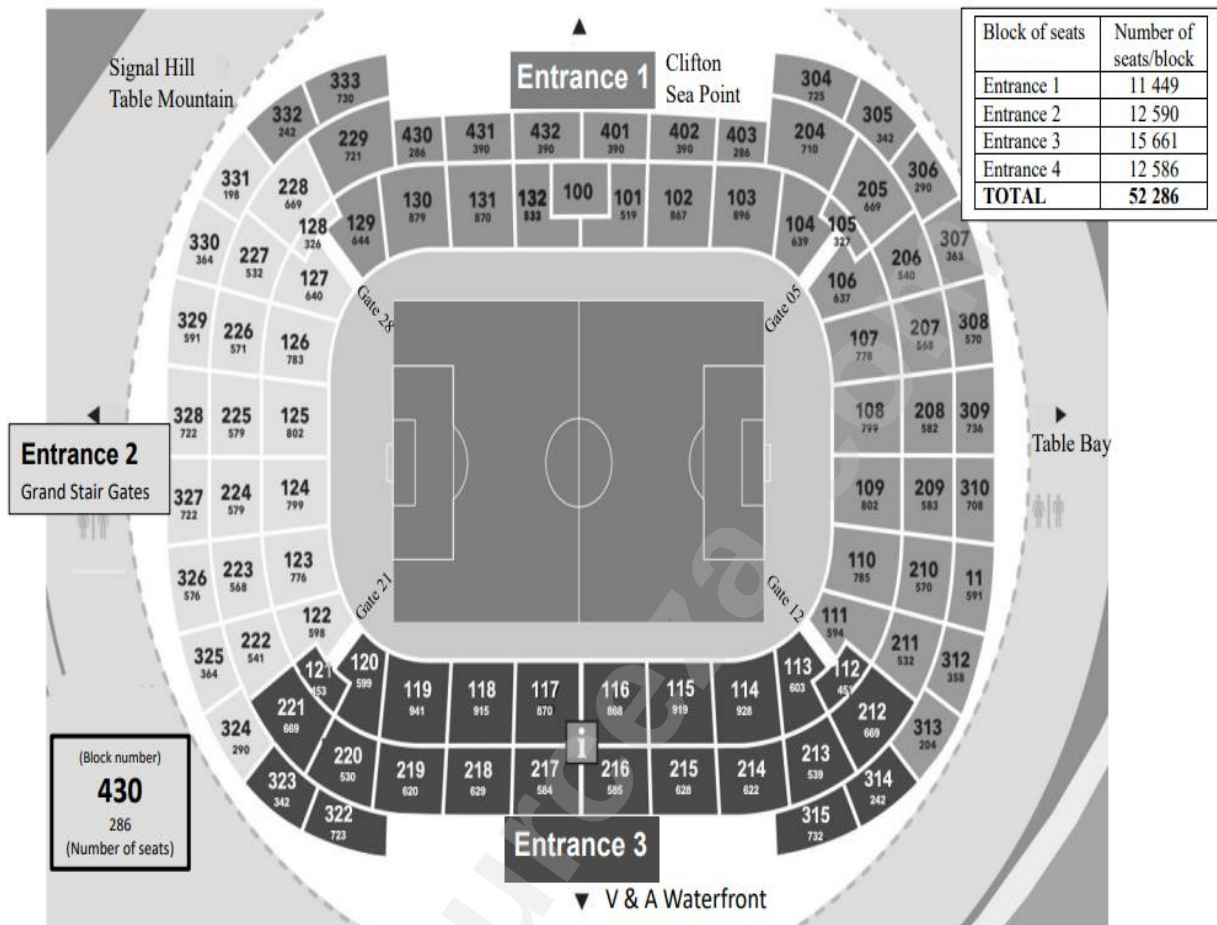
1 : 15 000

2.2 ANNEXURE B shows a seating plan of the Cape Town Stadium. Use ANNEXURE A as well as ANNEXURE B to answer the following questions.

- 2.2.1 Determine the direction in which a person will face when leaving through Entrance 3. Provide a reason for your answer. (3)
- 2.2.2 Determine the probability as a percentage, of randomly trying to get a seat in blocks 401 to 403, if all seats in the stadium are available to be used. (3)
- 2.2.3 Determine the scale, rounded to the nearest hundred, of the layout plan if the length of the playing field is 125 m. (5)

[26]

ANNEXURE B: QUESTION 2.2 – SEATINGPLAN OF CAPE TOWN STADIUM

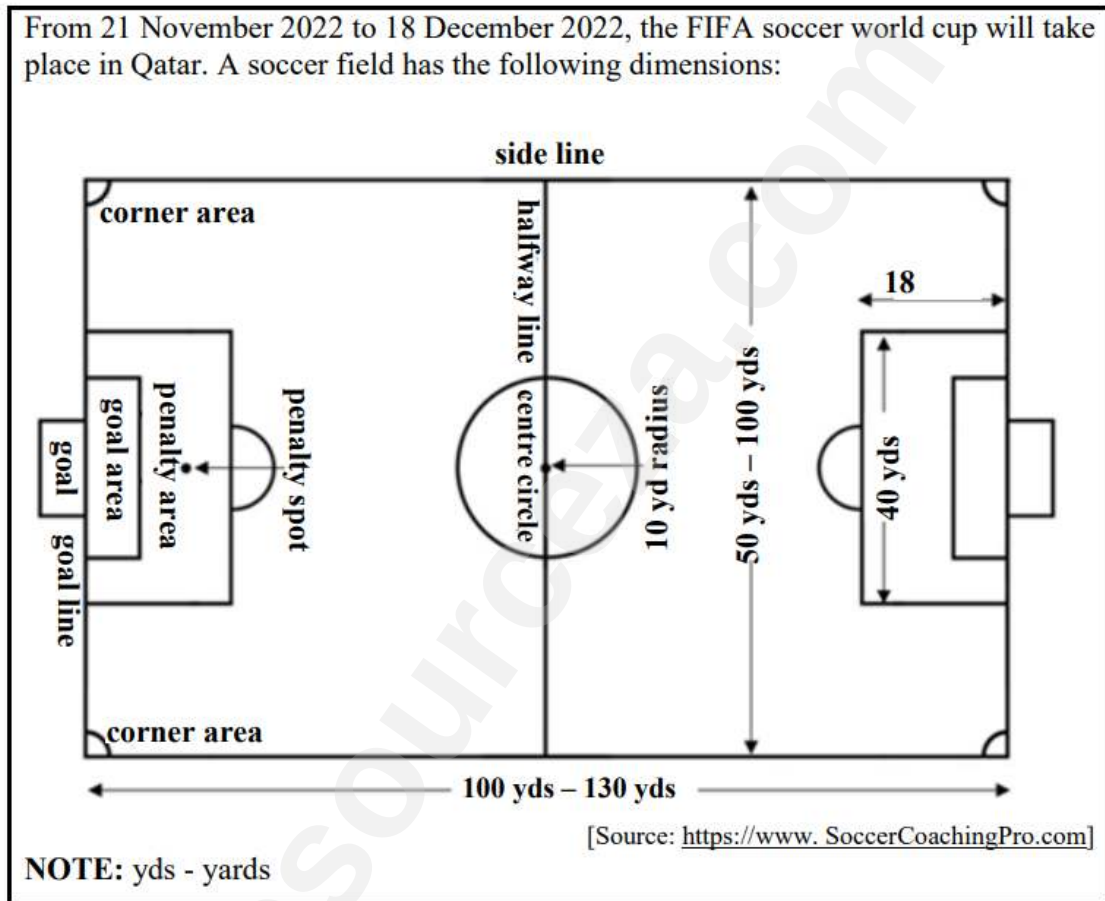


QUESTION 7 [MEASUREMENTS]

Activity 1

LEVEL 1-2 QUESTIONS{3.1.1 , 3.1.2 , 3.1.3 , 3.2.1 , 3.2.2b , 3.3.2 , 3.3.3}

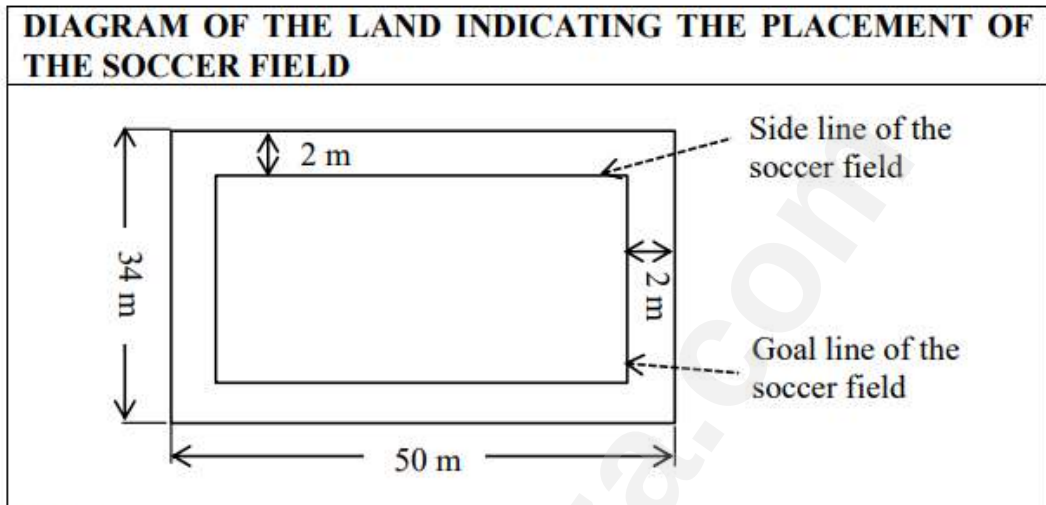
- 3.1 From 21 November 2022 to 18 December 2022, the FIFA soccer world cup will take place in Qatar. A soccer field has the following dimensions:



Use the information above to answer the questions that follow.

- 3.1.1 How many days will the FIFA soccer world cup be played in 2022? (3)
- 3.1.2 If the diameter of the centre circle of the soccer field is 18,288 m, determine the conversion factor of yards to meters. Round off your answer to four decimal places. (4)
- 3.1.3 Write the ratio of the maximum length of the soccer field to the minimum width of the soccer field (in yards) in the simplest form. (3)

- 3.2 Bantini primary school has a piece of land on which they want to build a soccer field. The diagram below shows the land size and the placement of the soccer field.



Note:

- The whole area will be covered with artificial grass.
- All around the soccer field is a 2 m runoff.

Because of the size of a full soccer field, smaller fields with fewer players are possible. In TABLE 1, the sizes for these various fields are given per number of players.

TABLE 1: DIMENSIONS OF SOCCER FIELDS PER NUMBER OF PLAYERS

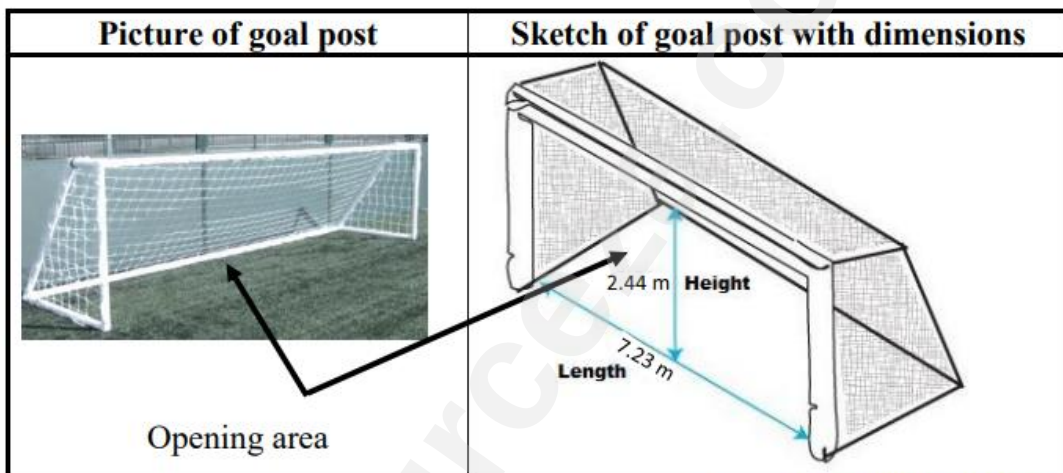
FORMAT	MINIMUM WIDTH	MINIMUM LENGTH	MAXIMUM WIDTH	MAXIMUM LENGTH
5-a-side	20 m	30 m	25 m	35 m
7-a-side	30 m	45 m	35 m	50 m
9-a-side	45 m	60 m	50 m	67 m

- 3.2.1 Artificial grass can be bought in rolls 50 m long by 2 m wide. Determine the number of rolls Bantini primary school must buy to cover the whole area. (3)
- 3.2.2 For the soccer field:
- (a) Determine the dimensions of the field. (4)
- (b) Write down the format of the game that can be played on this field. (2)

- 3.3 The goal posts for the different size soccer fields also differ. TABLE 2 shows the sizes of the goalposts given per number of players.

TABLE 2: SIZE OF GOAL POSTS

FORMAT	LENGTH	HEIGHT
5-a-side	3,66 m	1,22 m
7-a-side	3,66 m	1,83 m
9-a-side	4,88 m	2,13 m
11-a-side	7,32 m	2,44 m



[Source: <https://www.quora.com>]

Area of a rectangle = length $\times$ width

Use the information to answer the questions that follow.

- 3.3.1 Thabo, a soccer player at Bantini primary school, states that the opening area of the 7-a-side goal posts is 40% of the opening of the 11-a-side goal post. Is Thabo correct? Do calculations to verify your answer. (5)

- 3.3.2 Which one of the following words describes the probability that a goal post for an 11-a-side format is 2,44 m high? (2)

Uncertain; most unlikely; even chance; highly possible; certain

- 3.3.3 Calculate the size of the net needed for the goal post of 11-a-side if the top depth (**t**) is 1 m and the bottom depth (**b**) is 2 m.

You may use the following formula:

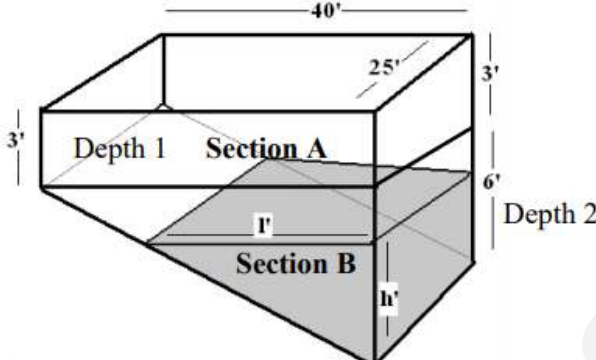
$$\text{Area of net} = (b + t) \times \text{height} + \text{length} \times t + \text{length} \times 2,64$$

(4)

[30]

Activity 2

LEVEL 1-2 QUESTIONS{3.1 , 3.2 , 3.4 , 3.5}

Mrs Phalatsi would like to have a swimming pool at her house. She is comparing the size of two shapes of swimming pools. Pool A is rectangular in shape with the depth increasing uniformly from 3 feet to 9 feet. Pool B is cylindrical in shape with a diameter of 5 m. Below are the diagrams of both pools.	
POOL A (rectangular in shape) 	POOL B (cylindrical in shape) 
Pool A dimensions Length: 40 feet Width: 25 feet Depth 1: 3 feet Depth 2: 6 feet	Pool B dimensions Diameter: 5 m Depth :
The following formulae may be used: Area of a rectangle = length $\times$ width (depth) Area of a triangle = $\frac{1}{2} \times$ base $\times$ height Area of a circle = $\pi \times \text{radius}^2$ (let $\pi = 3,142$) (depth) Volume of a cylinder = $\pi \times \text{radius}^2 \times \text{height}$ Circumference = $\pi \times \text{diameter}$ $\pi = 3,142$ $1 \text{ m}^3 = 1\,000 \text{ litres}$ $1 \text{ foot} = 0,3048 \text{ m}$	

- 3.1 Explain the term *circumference*. (2)
- 3.2 Convert the length of the rectangular pool to metres (m). (2)
- 3.3 Mrs Phalatsi claims that pool A can hold over 169 000 litres of water. If the volume of water for section A of her pool is given as 84 951 ℓ, determine whether Mrs Phalatsi's claim is correct. (8)

- 3.4 Choose the correct letter that will make the following statement TRUE.

The formula to calculate the volume of pool B is:

A $\pi \times 5 \times \text{height}$

B $\pi \times 2,5^2 \times \text{height}$

C $\pi \times 5^2 \times \text{height}$

(2)

- 3.5 Pool B is estimated to hold 65 000 litres of water. Determine the depth of pool B and round-off your answer to two decimal places.

(5)

- 3.6 Pool B is filled with water at a rate of $1,5 \text{ m}^3$ per minute, hence Mrs Phalatsi claims that it can be filled to 92% of its capacity by 8:00 if the filling process starts at 7:30. Verify whether Mrs Phalatsi's claim is correct.

(5)

- 3.7 Mrs Phalatsi chose pool A. Give ONE possible reason why she opted for pool A, even though pool A uses more water than pool B.

(2)

- 3.8 When Mrs Phalatsi wanted to swim in her new pool, the temperature of the water was 19°C and she said she would only swim if the temperature of the water was 25°C . The temperature must increase by 6°C .

Calculate what the temperature change would be in $^\circ\text{F}$.

You may use the following formula: $(^\circ\text{F} - 32) \div 1,8 = ^\circ\text{C}$

(5)

[31]

Activity 3

LEVEL 1-2 QUESTIONS{3.2.4}

Pearl wants to install four Jojo tanks on her property to grow vegetables. The diameter of one Jojo tank is 1 820 mm.

AN IMAGE SHOWING FOUR JOJO TANKS



NOTE: 1 000 cm³ = 1 litre

[Source: www.jojo.co.za]

Use the information above to answer the following questions.

- 3.1.1 Calculate the height of ONE Jojo tank in cm if it has the capacity of 5 250 litres.

You may use the formula:

$$\text{Volume of a Cylinder} = 3,142 \times \text{radius}^2 \times \text{height} \quad (7)$$

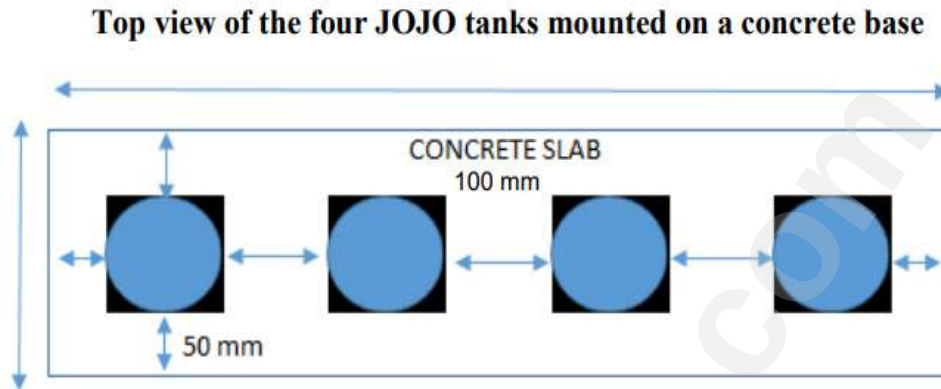
- 3.1.2 Pearl states that a Jojo tank should hold 5 000 litres of water if its filled to 80% capacity.

Verify, using a calculation, if this statement is CORRECT. (4)

- 3.1.3 Calculate the total number of kilolitres the four Jojo tanks can hold if they are filled to capacity.

NOTE: 1000 litres = 1 kilolitre (4)

The four Jojo tanks are mounted on a concrete slab. The diameter of each Jojo tank is 1 820 mm. The concrete slab has a 50 mm allowance along the width and the length of the slab.



NOTE: 1 m = 1 000 mm

Use the information in the diagram above to answer the following questions.

3.2.1 Determine the length of the concrete slab in metres. (8)

3.2.2 Hence, determine the width of the concrete slab in metres. (4)

3.2.3 Calculate the volume of the concrete slab in cubic metres, if the height of the concrete slab is 85 mm.

You may use the formula:

$$\text{Volume} = \text{length} \times \text{breadth} \times \text{height} \quad (4)$$

3.2.4 To mix 1 cubic metre of medium strength concrete you will need:

- 7 bags of cement
- 0,70 cubic metres of sand
- 0,70 cubic metres of stone

Determine the quantity of cement, sand and stone required for the concrete slab the Jojo tanks sits on. (4)

[35]

Activity 4

LEVEL 1-2 QUESTIONS{3.1.1 , 3.1.3 , 3.2.1 , 3.2.2 , 3.2.4a , 3.2.4b , 3.3.1 , 3.3.2 , 3.3.3 , 3.3.4}

- 3.1 A cricket pitch is the area between two wickets. A cricket wicket consists of 2 bails on 3 stumps.

DIAGRAM 1: CRICKET PITCH AND WICKETS

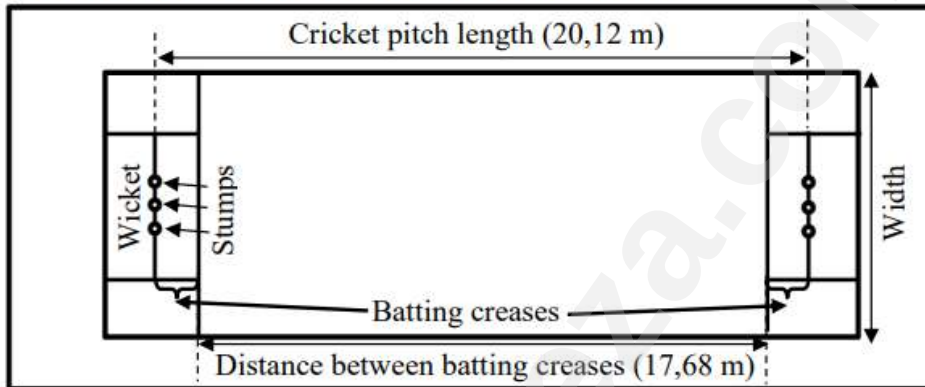
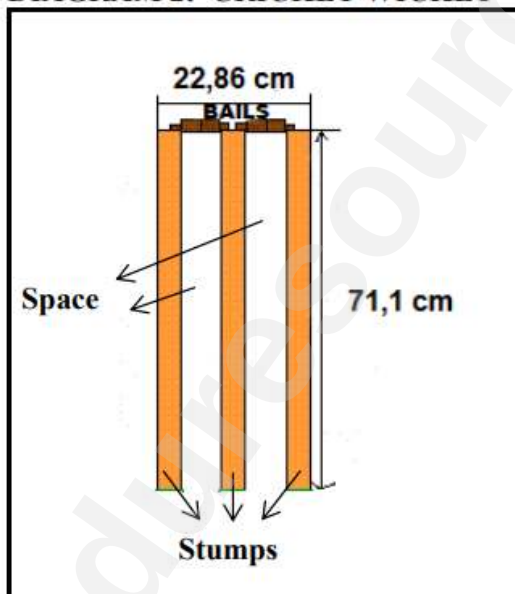


DIAGRAM 2: CRICKET WICKET



NOTE:

Length of cricket pitch: 20,12 m
Distance between batting creases: 17,68 m
Width of each wicket: 22,86 cm
Height of stump: 71,1 cm
Diameter of ONE stump: 3,81 cm

CRICKET FIELD



[Source: <http://cricketlearn.tripod.com>]

Use the information, DIAGRAM 1 and DIAGRAM 2 above to answer the questions that follow.

- 3.1.1 Determine the number of stumps that are on a cricket field during a match. (2)
- 3.1.2 Calculate the space (in cm) between two stumps. (4)
- 3.1.3 Define perimeter within the given context of the cricket field. (2)

- 3.1.4 Calculate the perimeter of the area between the batting creases if the area thereof is 53,924 m².

You may use the following formulas.

$$\text{Area} = \text{length} \times \text{width}$$

$$\text{Perimeter} = 2 (\text{length} + \text{width}) \quad (5)$$

- 3.2 Thandi wants to buy a set of canisters for coffee, tea and sugar. TABLE 1 below shows two options. Each canister's lid is made of bamboo and 1 cm thereof goes into the canister.

TABLE 1: DIFFERENT SHAPES OF COFFEE, TEA AND SUGAR CANISTERS

OPTION 1		OPTION 2	
RECTANGULAR CANISTERS		CYLINDRICAL CANISTERS	
			
 lid goes in 1 cm Dimensions canister Height: 13,7 cm Length: 11,5 cm Width: 11 cm		 lid goes in 1 cm Dimensions canister Height: 13,7 cm Diameter: 11,6 cm	

[Source:www.therange.co.uk]

You may use the following formulas.

$$\text{Volume of a rectangular prism} = \text{length} \times \text{width} \times \text{height}$$

$$\text{Volume of a cylinder} = 3,142 \times \text{radius}^2 \times \text{height}$$

Use the information in TABLE 1 above to answer the questions that follow.

- 3.2.1 Define volume within the given context of the canisters. (2)
- 3.2.2 Determine the height of the sugar in both canisters if the canisters are filled to below the lid. (2)

- 3.2.3 Thandi estimated that the volume of the sugar in the cylindrical canister is at least 80% of the volume of the sugar in the rectangular canister. Verify whether her estimation is VALID. (8)

- 3.2.4 a) Determine the number of grams (to the nearest 100 g) of sugar Thandi can pour into the rectangular canister.

You may use the following formula.

$$\text{Density (g/cm}^3\text{)} = \frac{\text{Mass(g)}}{\text{Volume (cm}^3\text{)}}$$

NOTE: 0,8521134 gram sugar = 1 cm³ (3)

- b) Calculate the density (in g/cm³) of instant coffee if the cylindrical canister contains 300 g of instant coffee. (2)

- c) Hence, which of the two (sugar or instant coffee) is denser? (2)

- 3.3 The manufacturers of the canisters pack them in boxes before transporting them to retailers.

NOTE:

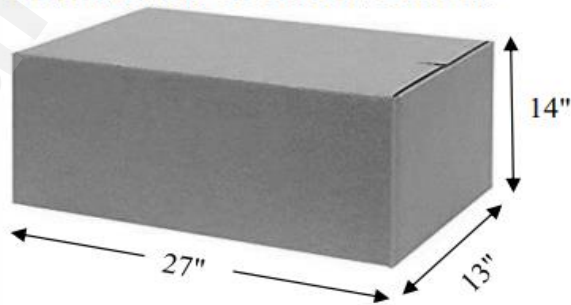
Length canister: 11,5 cm

Width canister: 11 cm

14" = 14 inches

1 inch = 2,54 cm

DIMENSIONS OF BOX IN INCHES



Use the information above to answer the questions that follow.

- 3.3.1 Convert the length and width of the box to centimetres. (3)

- 3.3.2 Determine how many rectangular canisters will fit into the length and into the width of the box. (3)

- 3.3.3 Hence, how many rectangular canisters will fit into the bottom of the box. (2)

- 3.3.4 State which unit (A, B or C) below is used to express the surface area of the box.

A. cm

B. cm²

C. cm³

(2)

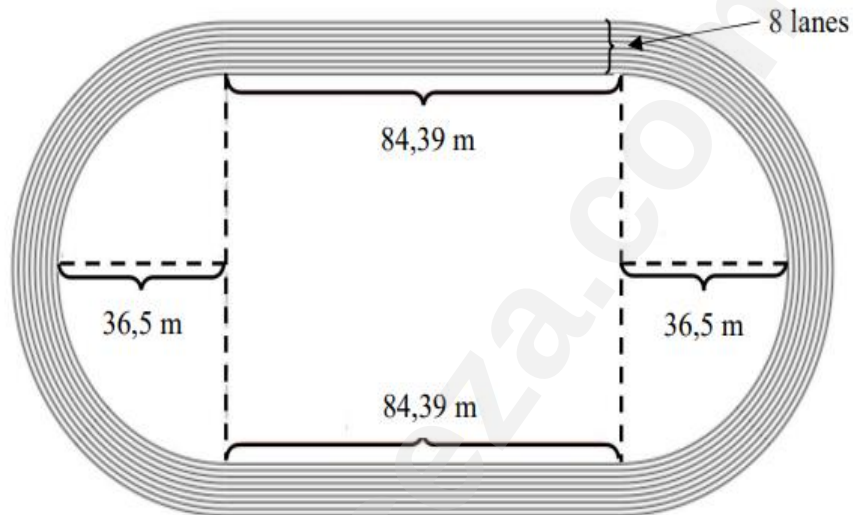
[42]

Activity 5

LEVEL 1-2 QUESTIONS{3.1.1 , 3.1.4 , 3.1.5a , 3.2.1}

3.1

The athletics track below is made up of a rectangle in the middle and two semi circles with a radius of 36,5 m at the ends. The length of the rectangle is 84,39 meters.



[Adapted from source:tasks.illustrativemathematics.org]

Use the diagram above and the information to answer the questions that follow.

- 3.1.1 Calculate the perimeter, in meter, of the rectangular area in the middle of the athletic track.

You may use the formula:

$$\text{Perimeter} = 2 (\text{length} + \text{width})$$

(3)

- 3.1.2 The groundskeeper stated that the cutting cost for the grass, which covers the entire area on the inside of the track, is R11 900. Show by means of calculations whether the cost per m^2 is more than R1,20 per square metre.

You may use the following formulae:

$$\text{Area of circle} = \pi \times \text{radius} \times \text{radius}, \quad \text{use } \pi = 3,142$$

$$\text{Area of rectangle} = \text{length} \times \text{width}$$

(7)

- 3.1.3 The athletics club manager wants to erect a fence 5 meter away from the track, on the outside perimeter of the outer lane.

Note: The outer radius that is ending at the outer lane, is 46,26 meters.



The sales person from Brights hardware store stated that the required length of fencing needed, will be more than 490 meters.

Verify using calculations if he is correct. (5)

- 3.1.4 He pays R120,45 per running meter for the fencing. Calculate the total cost for the fence. (2)

- 3.1.5 The fence must be supported by poles.

The dimensions of the poles are as follow:

Length = 1,8 m

Diameter = 0,24 m.

The holes that they dig for the poles must have the following dimensions.

	You may use the following formula: Volume = $\pi \times (\text{radius})^2 \times \text{height}$ Use $\pi = 3,142$
--	---

- a) The hole that they need to dig needs to have a diameter of $\frac{3}{4}$ more than the diameter of the pole. Determine the diameter of the hole that needs to be dug. (2)
- b) Hence, determine the volume of concrete (in m^3) needed, if the pole will take up $0,0294 \text{ m}^3$ of the space. (5)

- 3.2 The athletics manager was recruiting the boys age 10 to 20 years to join the athletics team. The athletes had to provide their age, height and mass to join the club.

Below is a table of their age, height and mass as well as a BMI Weight status table.

TABLE 1: Age, Height and Mass of 4 boys

Name	Age (years)	Height (cm)	Mass (kg)
Pule	18	162	81
Mimi	15	135	50
Oupa	19	146	68.3
Vusi	17	178	69

TABLE 2: BMI - WEIGHT STATUS TABLE

BMI	Weight status
< 18,5	Underweight
18,5 to 24,9	Healthy
25 to 29,9	Overweight
≥30	Obese

[Adapted from ncbi.nlm.nih.gov]

Use the TABLES 1 and 2 above to answer the following questions.

- 3.2.1 Identify the possible weight status of a person with a BMI of more than 25. (2)

- 3.2.2 Pule was told by his doctor that he must lose weight. He stopped eating fatty foods and did more exercise.

Prove by using calculations whether the doctor was correct to say Pule was overweight before he started dieting and exercising. Write your answer to the nearest whole number.

You may use:

$$\text{BMI} = \frac{\text{Mass in kg}}{[\text{Height in m}]^2}$$

(4)
[30]

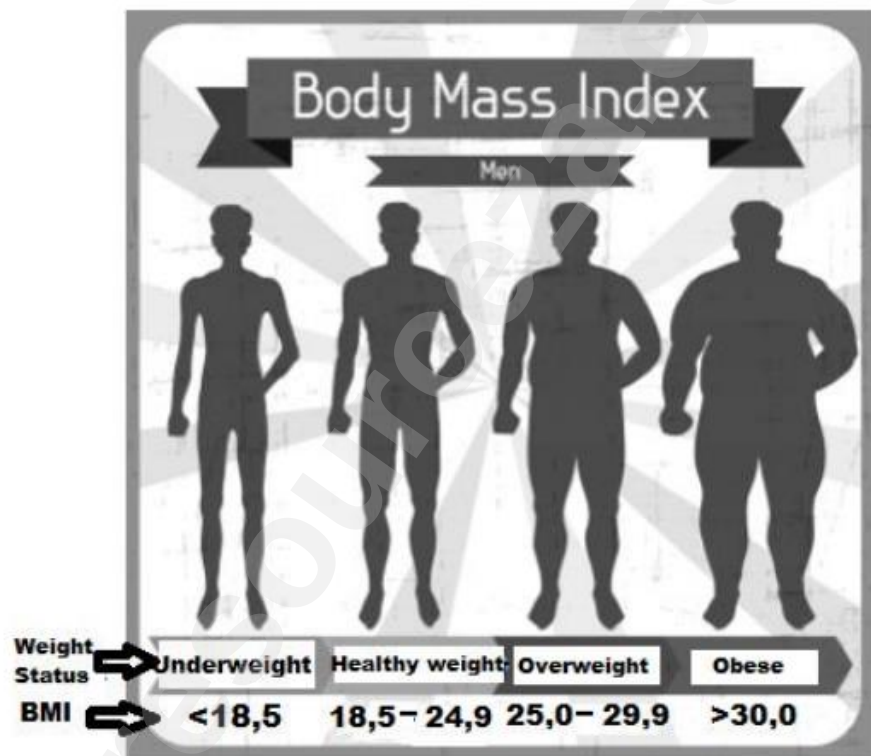
QUESTION 8 [INTERGRATED MEASUREMENTS AND MAPS]

Activity 1

- 4.1 The Two Oceans Marathon takes place annually in the Western Cape over the Easter weekend. Jonathan is a marathon runner who wishes to participate in the Two Oceans Marathon. Jonathan decides to prepare hard for the marathon, becoming fit, watching his weight and eating healthy.

The following is a chart that can be used to determine the weight status of a person based on the Body Mass Index (BMI) of a person:

BMI CHART FOR MALES



[Source: nestle-caribbean.com]

BMI can be calculated using the following formula:

$$\text{BMI} = \frac{\text{Weight}}{(\text{length in m})^2}$$

Use the information above and answer the questions that follow.

- 4.1.1 Jonathan has a mass of 82 kg and a length of 1,79 m. Determine Jonathan's weight status based on his Body Mass Index. (3)
- 4.1.2 What should Jonathan do about his weight to ensure he gets ready to participate in the Two Oceans Marathon? (2)

- 4.2 Jonathan stays in Bloemfontein and will travel to Cape Town by car to participate in the Two Oceans Marathon.

NOTE:

- The distance from Bloemfontein to Cape Town is 1 005,6 km.
- The car he travels with has a fuel consumption of 8,2 litres per 100 km.
- The cost of petrol is R19,54 per litre.

Use the information above and answer the questions that follow.

- 4.2.1 Jonathan states that it will cost less than R3 200,00 to make a round trip from Bloemfontein to Cape Town. Do calculations to determine if Jonathan is correct or not. (6)

- 4.2.2 Jonathan leaves Bloemfontein at 05:00. He stops three times on his way to Cape Town:

- At Colesburg for 1 hour to eat breakfast.
- At Beaufort West for 25 minutes to take a comfort break.
- At Laingsburg for 25 minutes.

If he travels at an average speed of 95 km/h, at what time will he arrive in Cape Town?

You may use the following formula:

$$\text{Speed} = \frac{\text{distance}}{\text{time}} \quad (6)$$

- 4.3 The elevation map with the distance chart for the Two Oceans Marathon is shown in ANNEXURE C.

Use ANNEXURE C to answer the questions that follow:

- 4.3.1 Write down the total distance of the Two Oceans Marathon and the name of the place where it finishes. (3)

- 4.3.2 What is the third highest point of the Two Oceans Marathon, and what is the height above sea level (in km) at this point? (4)

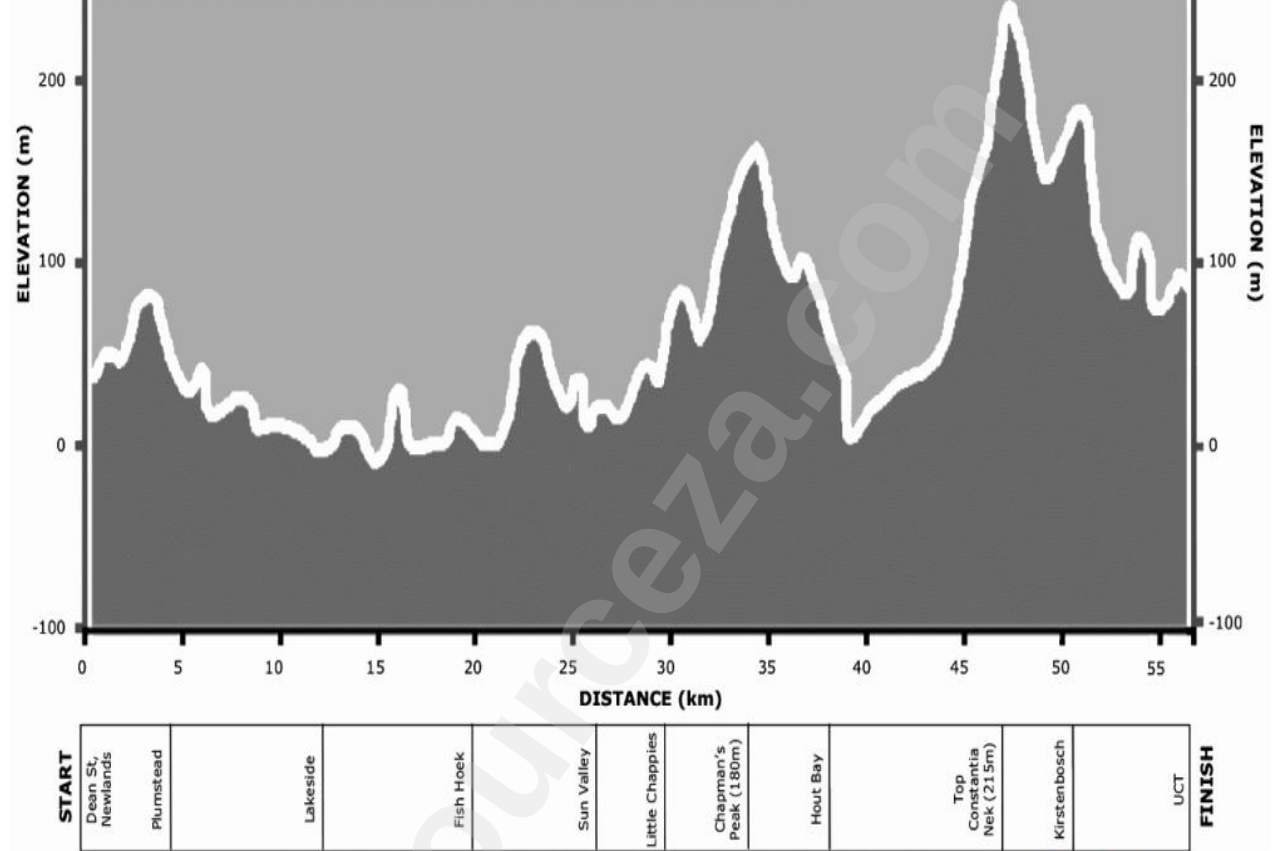
- 4.3.3 Currently, 11 000 runners run the Two Oceans Marathon. Jonathan calculates that if the number of runners who participate is the same as the entry limit, the percentage increase in the number of runners would be approximately 45,45%. Do calculations to determine if Jonathan is correct. (4)

[28]

ANNEXURE C

QUESTION 4.3

ELEVATION MAP AND DISTANCE CHART OF TWO OCEANS MARATHON

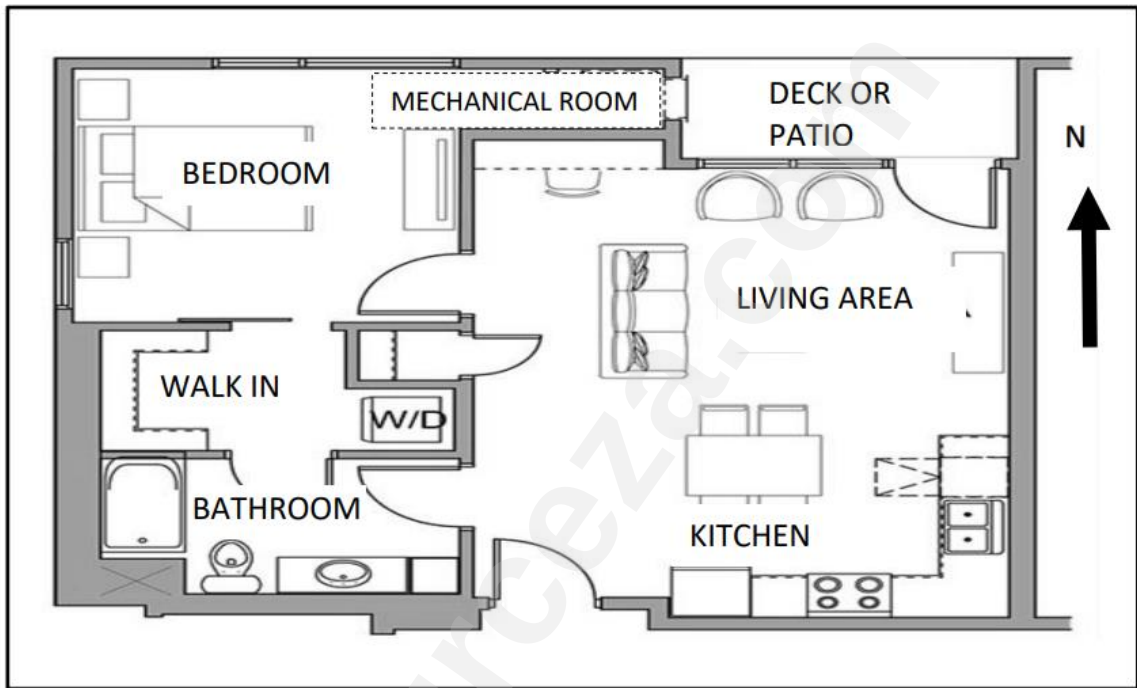


[Source: runner.co.za]

Activity 2

- 4.1 Sakhile has enrolled at the University of Johannesburg and is renting a bachelor flat in Johannesburg. Use the floor plan of Sakhile's flat below and answer the questions that follow.

FLOOR PLAN OF SAKHILE'S BACHELOR FLAT



Scale 1:100

[Adapted from www.pinterest.com]

NOTE:

Area of bachelor flat = 322,36 square feet (ft²)

100 cm² = 0,107639 square feet (ft²)

- 4.1.1 Write down the number of doors which open into the living area and kitchen. (2)
- 4.1.2 Use the given scale to calculate the actual length of the bedroom, including the mechanical room. (5)
- 4.1.3 Convert the area of the bachelor flat to m². (4)
- 4.1.4 Sakhile states that he likes an open plan flat. Does this bachelor flat qualify as an open plan flat? Give a reason for your answer. (2)

- 4.2 Mr Botha, the owner of the flat where Sakhile stays, wants to build a fire pit in the back yard. He searched on the internet and got the idea as indicated in ANNEXURE B. Use ANNEXURE B to answer the questions that follow.

The hole for the fire pit must be 4 feet wide and 12 inches deep.

NOTE:

1 foot = 30,48 cm

1 inch = 2,54 cm

1 gallon = 3,7854 ℓ

- 4.2.1 Determine the radius of the fire pit in centimetres. (4)

- 4.2.2 Determine the volume of the fire pit in cm^3 .

You may use the following formula:

Volume of cylinder = $\pi \times \text{radius}^2 \times \text{height}$; using $\pi = 3,142$ (4)

- 4.2.3 What is the formula used to calculate the boundary around the circle? Choose the correct answer from the options given below. Write only the correct letter (A – D) next to the question number.

A Circumference of a circle = $\pi \times \text{diameter}$

B Circumference of a circle = $\pi \times \text{radius}$

C Area of a circle = $\pi \times \text{radius}^2$

D Volume of a cylinder = $\pi \times \text{radius}^2 \times \text{height}$ (2)

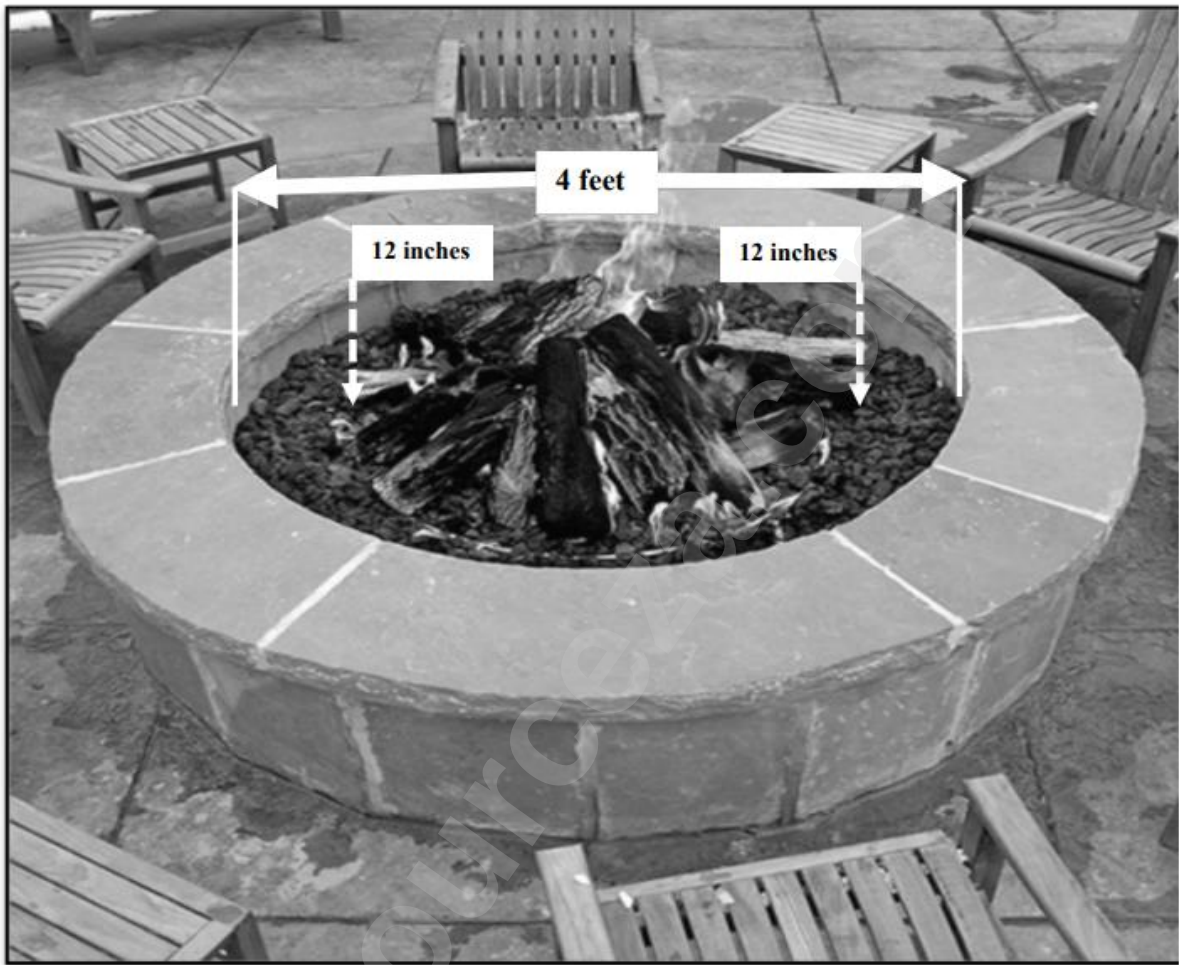
- 4.2.4 Hence, calculate the circumference of the hole for the fire pit. Round-off your answer to three decimal places. (3)

- 4.2.5 A layer of three 5 gallon buckets of lava rocks must be placed in the hole. Mr Botha said that two and three quarters of a 20 ℓ bucket is equal to three 5 gallon buckets.

Verify his statement, and state whether there will be a surplus or shortage of lava rocks.

(5)
[31]

ANNEXURE B: QUESTION 4.2

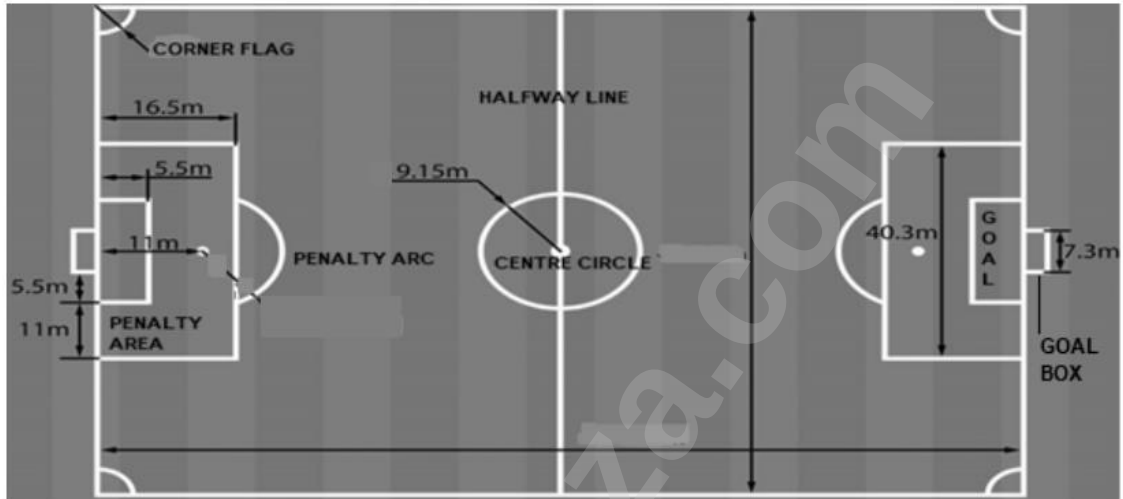


[Source: <https://www.chimneyspecialistsinc.com/blog/in-ground-fire-pits-vs-above-ground-fire-pits/>]

Activity 3

4.1

According to FIFA, a soccer field must be 105 metres in length and 68 metres wide. The radius of the centre circle is 9,15 metres. The marking lines on the soccer field need to be remarked. The diagram of the soccer field is shown below.



NOTE: The total length of the 4 corner flags quarter circles and 2 penalty arcs are 22. 25 metres.
The width of the goal box is 5,5 m.

[Adapted source: www.vectorstock.com]

Use information above to answer the following questions.

4.1.1 Determine the sum of the perimeter of the field and the halfway line.

You may use the formula:

$$\text{Perimeter of a rectangle} = 2(\text{Length}) + 2(\text{Width}) \quad (3)$$

4.1.2 Hence, calculate the total length of all the white lines required to mark the soccer field.

You may use the formula:

$$\text{Circumference of a circle} = 2\pi r \quad \text{where } \pi = 3,142 \quad (6)$$

4.1.3 The width of white line marking the field is 12 cm. Determine the area of the white marking lines.

You may use the formula:

$$\text{Area of a rectangle} = \text{Length} \times \text{Width} \quad (4)$$

4.1.4 Calculate the total cost of white marking paint, if 1 litre of paint covers 6 m^2 and a 5 litre tin of paint costs R328,49. (6)

4.2

Tin cans are stored in the storage rack as seen in the diagram below. The height of each can is 14 cm. There is a 5 cm gap between the can and the height of the shelf.



[Source: www.shopping24.com]

Use the information above to answer the following questions.

- 4.2.1 Four cans are packed along the width of the rack. Determine the radius of a can in cm. (6)
- 4.2.2 Determine the height of this rack in metres, excluding the height of the legs if there is a gap of 5 centimetres between the can and the shelf. (4)
- 4.2.3 Determine the total number of cans that this rack can hold, showing all calculations. (3)

[32]

Activity 4

- 4.1 MAC Office Supplies is situated in Nelspruit (Mbombela) and supplies photocopying paper to schools at a discounted price when they buy in bulk.

For bulk supply, boxes are packed into 4 layers on a pallet. Each layer has 5×4 boxes.

A standard truck transports 20 pallets of photocopying paper.

A BOX WITH REAMS OF PHOTOCOPYING PAPER



Surface area of a rectangular prism = $2(l \times w) + 2(l \times h) + 2(w \times h)$

Where l = length; w = width and h = height

Use ANNEXURE E and the information above to answer the questions that follow.

- 4.1.1 Calculate the total surface area (in m^2) of ONE box. (4)
- 4.1.2 Show, by means of calculation, that the height of ONE full pallet is 120,9 cm. (2)
- 4.1.3 Calculate the total weight (in kg) of ONE full pallet. (5)
- 4.1.4 Hence, determine the maximum weight (in kg) of ONE load to be loaded onto a standard truck. (2)

ANNEXURE E

QUESTION 4.1

A BOX WITH REAMS OF PHOTOCOPYING PAPER



BOX DIMENSIONS

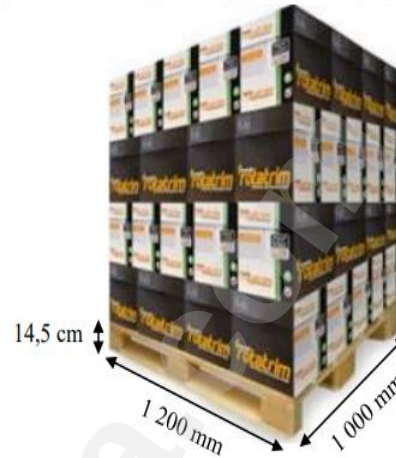
Length = 30,4 cm

Width = 22 cm

Height = 26,6 cm

[Source adapted from mcsofficesupplies.co.za]

FULL PALLET WITH BOXES OF PHOTOCOPYING PAPER



Mass of one box = 12,47 kg

Weight of an empty pallet = 18 kg

STANDARD TRUCK TYRE



NOTE: The circumference of the truck tyre is 235,65 cm.

- 4.1.5 Tyre manufacturers use a tyre load index to determine the carrying capacity of a tyre.

NOTE:

A Tyre load index is a numerical value that indicates the maximum weight that each tyre is able to carry.

Weight of truck without 20 pallets = 8 688 kg

* μ - tyre load index

*kg - carrying capacity, which includes the weight of the truck

TABLE 2: *TYRE LOAD INDEX

* μ	*kg	μ	kg	μ	kg
183	8 750	223	27 500	263	87 500
184	9 000	224	28 000	264	90 000
185	9 250	225	29 000	265	92 500
186	9 500	226	30 000	266	95 000
187	9 750	227	30 750	267	97 500
188	10 000	228	31 500	268	100 000

[Adapted from www.treadwright.com]

The driver of the truck mentioned that a fully loaded standard truck needs a tyre index of 265 μ .

Use TABLE 2 and the information above to determine the tyre load index and verify whether the statement of the driver is VALID.

(4)

- 4.1.6 Use ANNEXURE E to determine the radius (in cm) of a standard truck tyre.

You may use the following formula.

Circumference of a circle = $2\pi r$

Use $\pi = 3,142$

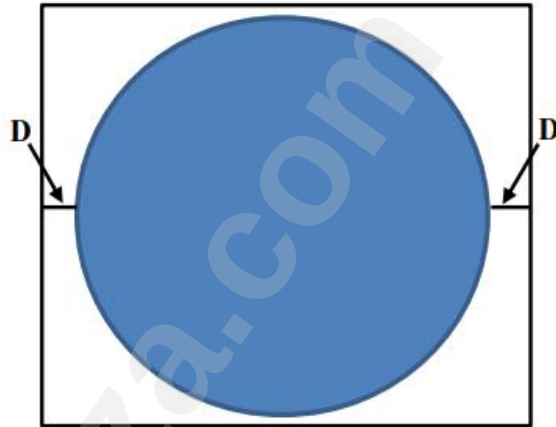
(3)

- 4.2 MAC Office Supplies has an order for photocopying paper that must be delivered in Komatipoort. The driver of the truck bought lunch from Pizza Hut on his way there.

The pizza has a diameter of 40 cm. It was cut into eight equal slices and served in a square box, as shown on the diagram below.



Dimensions of box are 42 cm × 42 cm



Area of a square = side × side

Area of a circle = $3,142 \times \text{radius}^2$

Use the information above to answer the questions that follow.

- 4.2.1 Calculate the area of the pizza box. (2)
- 4.2.2 Determine the value of D. (2)
- 4.2.3 Calculate the area of the pizza. (2)
- 4.2.4 Determine the area of ONE slice of pizza. (2)
- 4.3 ANNEXURE F shows a map of Ehlanzeni. Both Nelspruit and Komatipoort are situated in Ehlanzeni, one of the three Mpumalanga districts.

Use ANNEXURE F to answer the questions that follow.

- 4.3.1 The driver of the truck claimed that he will cover the distance in less than 1,5 hours if he drives at an average speed of 80 km/h.

$$\text{Time (h)} = \frac{\text{Distance(km)}}{\text{Speed(km/h)}}$$

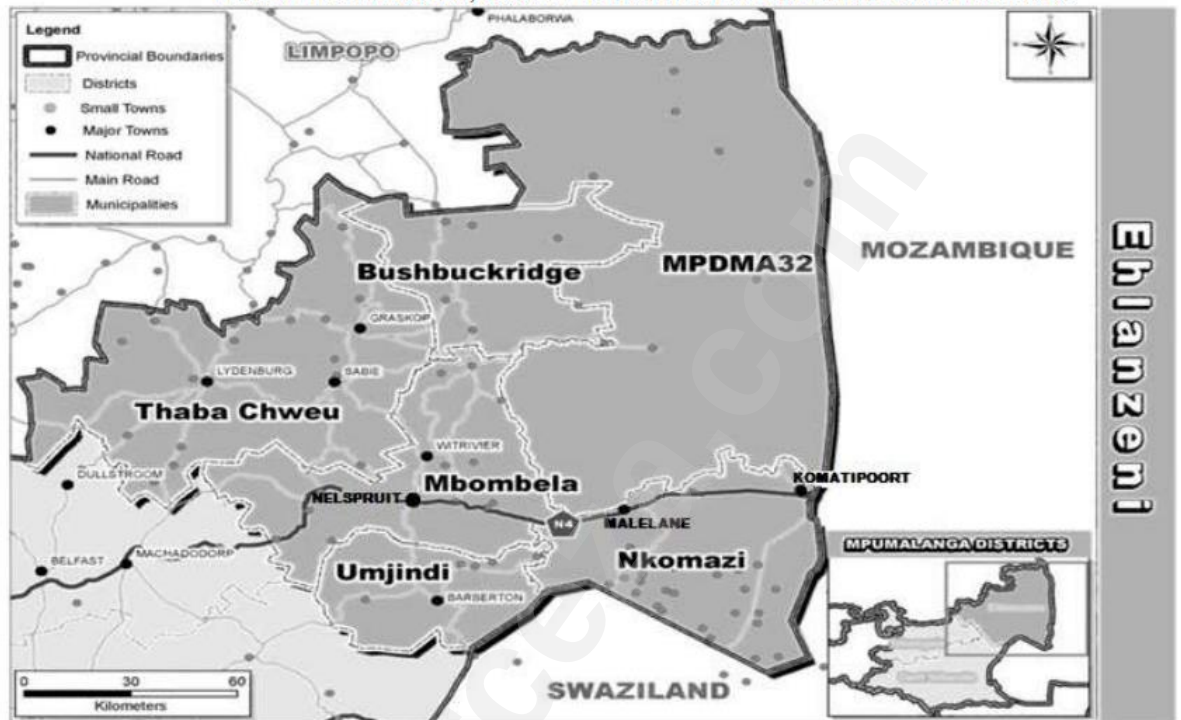
Determine if the driver was CORRECT. (6)

- 4.3.2 Determine the probability that the driver will travel on a national road from Nelspruit to Komatipoort. (2)

ANNEXURE F

QUESTION 4.3

MAP OF EHLANZENI, ONE OF THE THREE MPUMALANGA DISTRICTS



[Source: ResearchGate]

Activity 5

- 4.1 The Johnsons family plan a trip to the Golden Gate National Park, in the Free State.

The family arrive at the Bram Fischer International Airport in Bloemfontein; they hire a car and drive to the Golden Gate National Park. A map of their journey is found in ANNEXURE C.

Use ANNEXURE C to answer the following questions.

- 4.1.1 Write down ONE National Road that they travelled on when they travel via Senekal. (2)

- 4.1.2 Their journey takes 3 hours and 13 minutes. They booked at the Glen Reenen Rest Camp at the Golden Gate National Park. They arrive at their accommodation at 13:05.

Determine the time they left the airport. (2)

- 4.1.3 The family travels at an average speed of 100 km/h. Calculate the distance, to the nearest km, from the Airport to the Glen Reenen camp.

You may use the formula: $\text{Speed} = \frac{\text{Distance}}{\text{Time}}$ (5)

ANNEXURE C

QUESTION 4.1 – ROUTE MAP TO GOLDEN GATE NATIONAL PARK



[Source: <https://www.google.com/maps>]

4.2

The floor plan of the Rondavels at the Golden Gate National Park is given in ANNEXURE D.

IMPORTANT INFORMATION:

Rondavel's dimensions:

Height of the outside wall = 2,5 m

Area of the door = 3,6384 m²

Area of all the windows = 3,24 m²

Picture of rondavel



You may use the following formulae:

Surface Area of a part of a cylinder = $\pi \times \text{diameter} \times \text{height}$

Area of a rectangle = $\text{length} \times \text{breadth}$

Area of a circle = $\pi \times \text{radius}^2$

Use $\pi = 3,142$

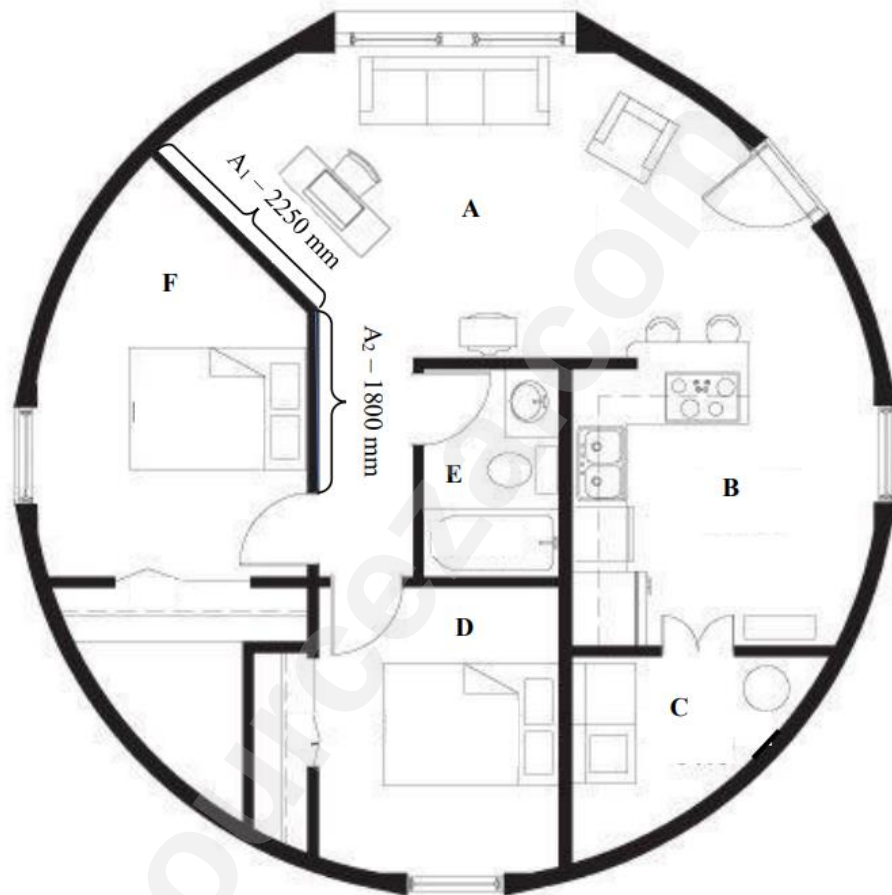
Conversion Table:

Inches	Centimeters		Feet	Inches
1"	2,54		1'	12"

Use ANNEXURE D, the above information of the rondavel's dimensions, the formulae given and the conversion table to answer the questions below.

ANNEXURE D

QUESTION 4.2 - FLOOR PLAN OF THE RONDAVELS AT THE GOLDEN GATE NATIONAL PARK



- 4.2.1 Write down the name of the type of room when entering the rondavel. (2)
- 4.2.2 The height of the interior walls is 2,1 m. The walls marked A1 and A2's dimensions are given in mm. These walls need to get new wallpaper.
- Calculate (in m^2) the amount of wallpaper needed for these walls. (3)
- 4.2.3 The diameter of the rondavel is given as 30 feet. Show that the length of the diameter to the nearest metre is 9 m. (3)
- 4.2.4 The National Park needs to paint the outside walls of seven 4-bed rondavels in the camp. Calculate the number of 20 litre tins of paint that must be purchased.
- NOTE: The spread rate of the paint is 5 litres per 16 m^2 . (8)

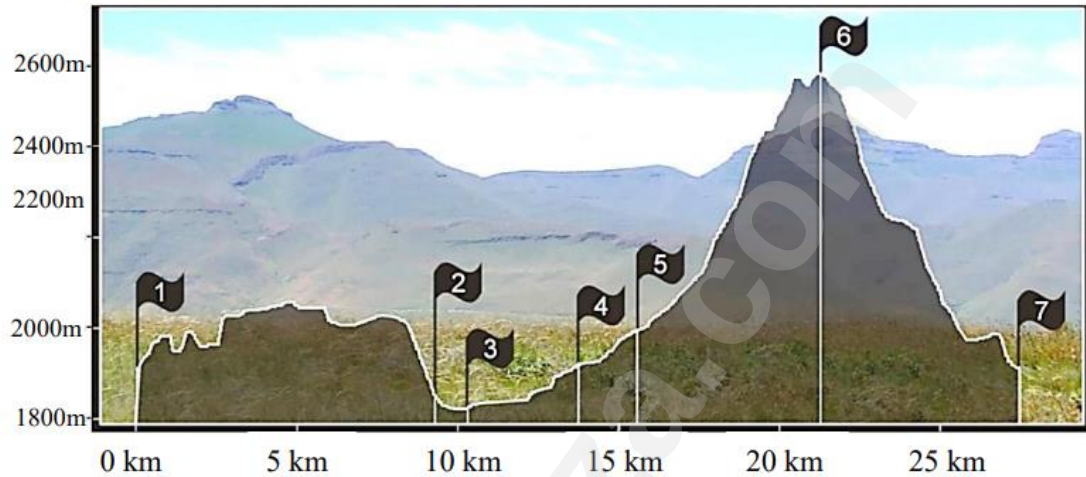
- 4.3 The Johnsons Family enjoy hiking and plan to hike the Ribbok Hiking Trail.

RIBBOK HIKING TRAIL

NB:

Distance: 27 km

Duration: 2 days



[Source:solitaryecology.com]

KEY TO FLAGS

1	Start: Glen Reenen Rest Camp	4	Ribbok Overnight Hut
2	Wilgenhof Environmental Education Centre	5	Natural Rock Pool
3	Western Entrance	6	Generaalskop View
		7	End: Glen Reenen Rest Camp

Use the Elevation map to answer the questions that follow.

- 4.3.1 Write down the flag number of the flag where the height of the hiking trail is 2 km from ground level. (2)

- 4.3.2 The difference between the highest point and the end point is 645 m and the elevation of Generaalskop View is 2 570 m.

Determine the height above sea-level of the end point. (2)

- 4.3.3 A hiking guidebook states the following:

“The Second Day of the Ribbok Trail Hike is the more challenging of the two-day hike”

Explain why this advice is given, by referring to the Elevation Map. (2)
[31]

QUESTION 9 [INTERGRATED MEASUREMENTS AND MAPS]

Activity 1

- 5.1 In ANNEXURE D, the floorplan of Josie's 2-bedroom house is shown.

Use the information in ANNEXURE D to answer the questions that follow.

- 5.1.1 Determine the total area of Josie's house, including the entry porch. (3)

- 5.1.2 Identify the following elevation of Josie's house:



(2)

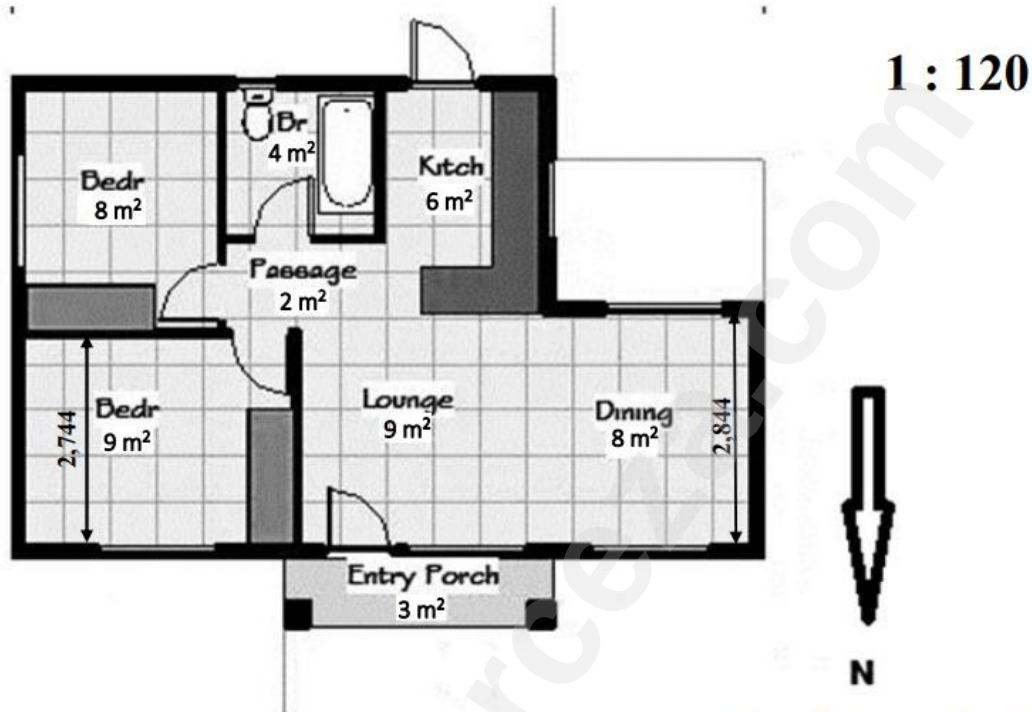
- 5.1.3 Name the type of scale indicated on the plan, and explain the meaning of this scale. (3)

- 5.1.4 The width of the bigger bedroom in real life is 2,744 m. Use accurate measurement to determine if the scale indicated on the plan is accurate. (4)

ANNEXURE D

QUESTION 5.1

PLAN OF JOSIE'S HOUSE



[Source: <https://www.nethouseplans.com>]

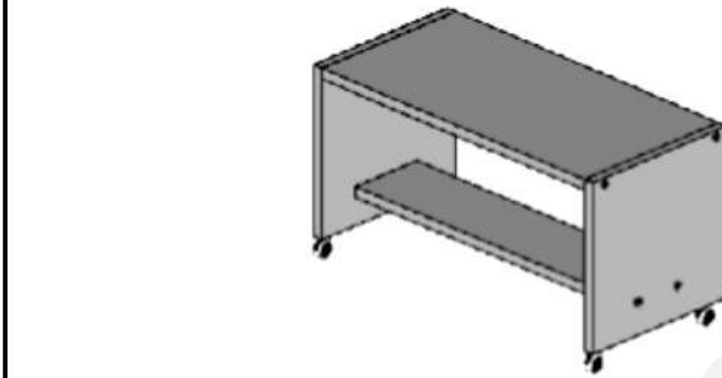
5.2 Josie wants to tile her dining room wall, which does not have any windows. The following applies to tile the wall:

- The area of the dining room wall is 7,11 m².
- The tiles are sold in boxes. One box of tiles is needed to tile 2,5 m².
- 5% more tiles should be bought to allow for breakage and cutting.
- The price of one box of tiles is R435,29.

Calculate how much it will cost to tile the one wall in the dining room.

(7)

- 5.3 Josie wants a new TV stand for her flatscreen TV. She visits a local store to buy a new TV stand. The stand on display in the store looks as follows:



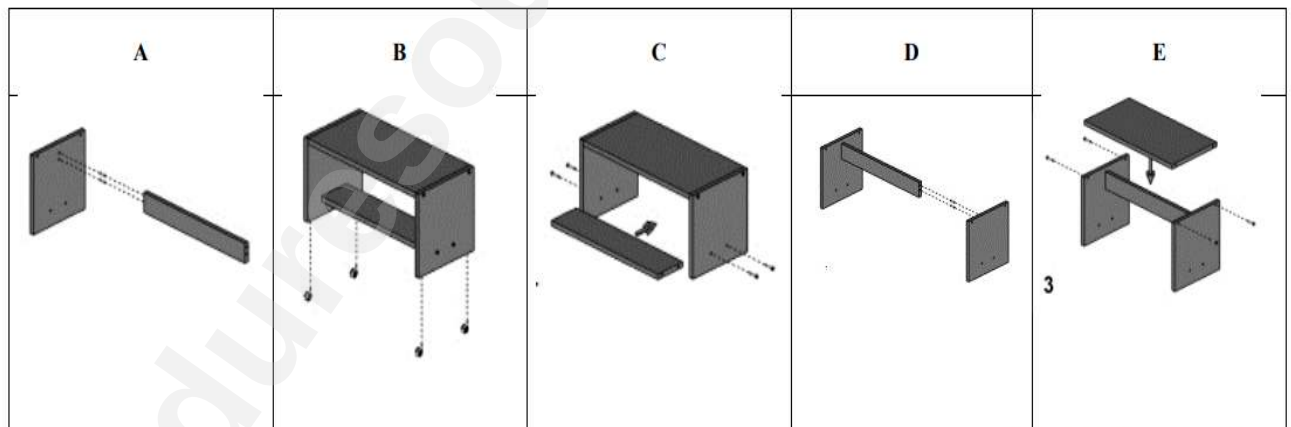
Josie buys the TV stand in a box. The assembly diagram, with pictures in mixed order, is shown in ANNEXURE E. Rearrange the pictures in ANNEXURE E in the correct order so that the final product will look like the TV stand shown in the picture above. Just write 1, 2, 3, 4, 5 in your answer book and the corresponding letter A, B, ... to indicate where it will fit into the sequence.

(5)

ANNEXURE E

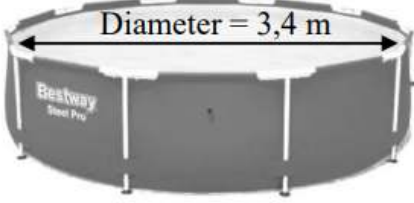
QUESTION 5.3

ASSEMBLY OF TV STAND



[Source: <https://graphics.stanford.edu/>]

5.4 Josie buys a cylindrical easy set pool for her children.

PICTURE OF EASY SET POOL	
	Take note of the following information for the pool: Height of the pool: 1,2 m Diameter of the pool 3,4 m $1000 \text{ cm}^3 = 1 \text{ litre}$

[Source: www.takealot.com]

Determine the volume of the pool in litres. Round your answer to the nearest 10.

You may use the following formula:

Volume = $\pi \times \text{radius}^2 \times \text{height}$ where $\pi = 3,142$ (5)
[29]

Activity 2

5.1

The map of Qatar and surrounding countries is shown in ANNEXURE B.

Use the information in ANNEXURE B to answer the following questions.

5.1.1 Name the capital of Bahrain as shown on the map. (2)

5.1.2 Which area lies south west of Doha? (2)

5.1.3 Identify the type of scale on this map. (2)

5.1.4 Convert this scale to a number scale. Write it in the form **1:** (5)

5.1.5 A tour guide stated that Al Khawr is 45 km away from Doha. Verify, showing all calculations, if this statement is TRUE. (5)

ANNEXURE B

QUESTION 5

MAP OF QATAR



[Source: www.geology.com]

5.2

The Qatari Riyal is the currency of Qatar. The cost of a taxi in Doha is as follows:

Taxi Start (Normal Tariff)	10.00 QR
Taxi 1km or part thereof (Normal Tariff)	2.50 QR

Source: [www.numbeo.com]

Use the information above to answer the following questions.

5.2.1 Determine the cost of hiring a taxi to Al Khawr from Doha. (3)

5.2.2 The taxi driver thinks he can make this trip in an hour if he travels at 80km/hour. Verify this claim, showing all calculations.

You may use the formula: **Distance = speed × time.** (3)

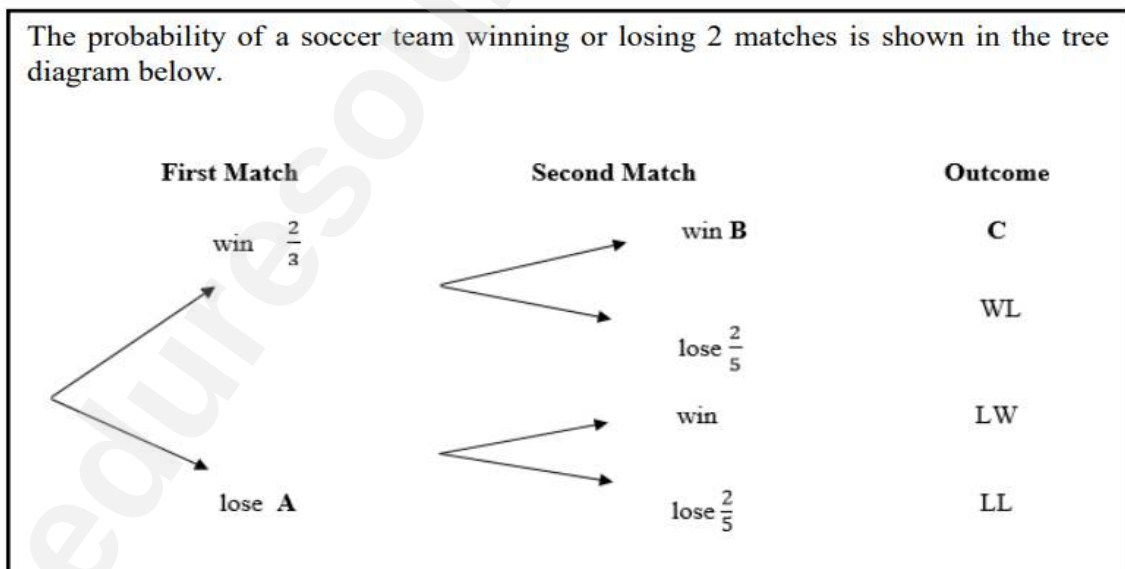
5.2.3 The taxi has a fuel capacity of 55 litres and a fuel consumption of 8 litres per 100 km.

The taxi driver states that he can make 6 return trips without refuelling.

Verify, using calculations, if this statement is CORRECT. (5)

5.3

The probability of a soccer team winning or losing 2 matches is shown in the tree diagram below.



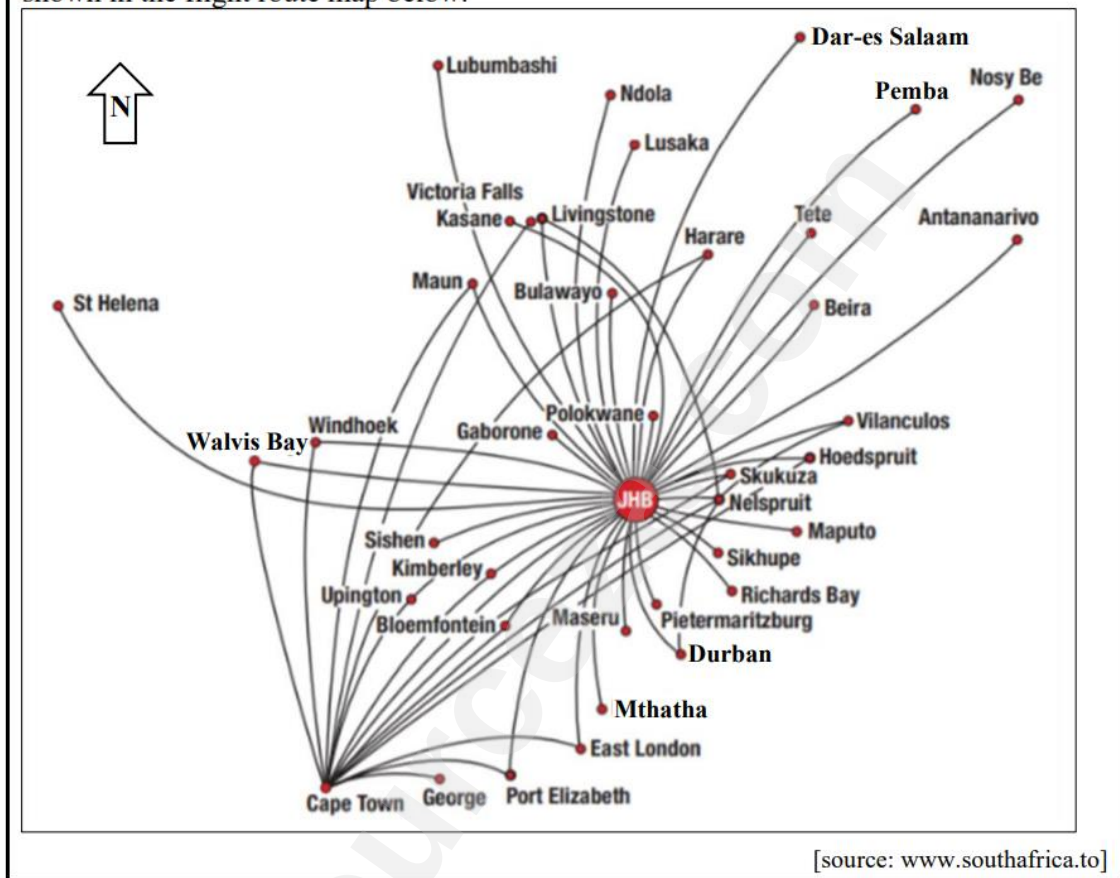
Use the information above to answer the following questions.

5.3.1 Fill in the missing values A, B and C. (3)

5.3.2 Determine the probability of winning two matches. Write your answer as a percentage. (3)

Activity 3

- 5.1 Airlink offers a service to travellers to visit many domestic and regional destinations as is shown in the flight route map below.



Use the flight route map above to answer the questions below.

- 5.1.1 Write down the two compass directions that a person would follow if the person takes a flight from Johannesburg to Dar es Salaam and then goes to Pemba. (2)
- 5.1.2 According to a pilot, the flight distance from Johannesburg to Antananarivo is 1 328 miles. Show by means of calculations that the scale of the flight route map is 1 : 33 393 898, if the measured distance from Johannesburg to Antananarivo on the map is 64 mm. (5)
- You may use the following:
1 km = 0,621371 mile
- 5.1.3 Describe the shortest flight route if a person wants to travel from Mthatha to Walvis Bay using the available flight routes shown on the map. (2)

The African Cup of Nations match between Burundi and Cameroon took place on 8 June 2022 in Dar Es Salaam in Tanzania. Vuyo and two of his friends planned long in advance to go and watch the game.

Below is a extract from the Airlink flight schedule from Johannesburg to Dar es Salaam and back.

TABLE 3: Airlink Flight Schedule between Johannesburg and Dar es Salaam

Johannesburg – Dar es Salaam – Johannesburg						
Flight	Route		Depart	Arrive	Frequency	Seats
4Z036	Dar es Salaam	Johannesburg	22:00	02:25	1 3 4 5 7	98
4Z037	Johannesburg	Dar es Salaam	03:25	06:10	1 3 4 5 7	98

[Adapted from flyairlink.com]

Use TABLE 3 and the information above to answer the questions that follow.

- 5.2.1 Determine the days on which no flights are scheduled to go to Dar es Salaam, if Monday is the first day according to their frequency schedule. (2)

- 5.2.2 They took flight 4Z037 on a Friday morning. It took them 35 minutes to collect their luggage and get a taxi. They drove at an average speed of 25,44 km/h and reached the stadium at 07:10. Calculate the distance to the stadium.

You may use the following:

$$\text{Speed} = \text{Distance} \div \text{Time} \quad (7)$$

- 5.2.3 On their flight to Dar es Salaam, they flew at an altitude of 35 000 feet. The air temperature decreases as the altitude increases. At an altitude of 35 000 feet the air temperature is -54°C . Calculate the temperature in degrees Fahrenheit.

You may use the following formula:

$$^{\circ}\text{F} = (1,8 \times ^{\circ}\text{C}) + 32^{\circ} \quad (3)$$

The Tanzania Energy Congress took place on 3 & 4 August 2022 at the Julius Nyerere International Convention Centre (JNICC). Annexure E shows the Ground floor plan of the JNICC. See the advertisement of the congress below.

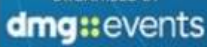


Tanzania Energy Congress

3 – 4 August 2022 – Dar Es Salaam, Tanzania

THE NEXT PHASE IN TANZANIA'S ENERGY SECTOR: PROMOTING INVESTMENT & GROWTH

ORGANISED BY

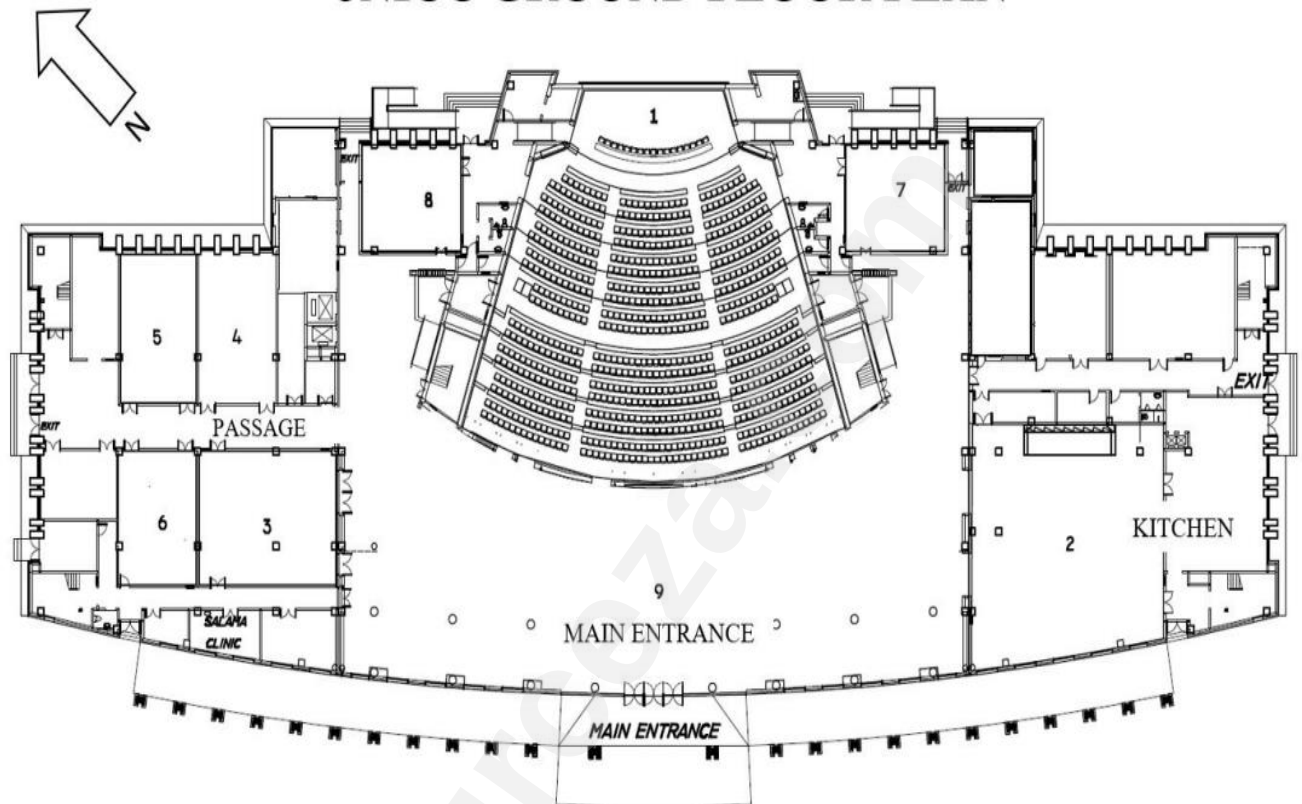


Use ANNEXURE E to answer the questions that follow.

- 5.3.1 The Selous Hall includes an auditorium with seating for 1 003 delegates. Identify the names of the two rooms closest to this hall. (2)
- 5.3.2 The COVID regulations accommodated only 66,6% of the full capacity of the Selous hall.
- Determine the number of delegates allowed to enter the hall during Covid. (2)
- 5.3.3 Determine the compass direction of the Mkomazi Hall from the Butiama VIP room. (2)
- 5.3.4 Give detailed directions to a delegate that is at the Main Entrance that needs to join his colleagues in the Udzungwa Room. (3)
- 5.3.5 Determine the probability, as a fraction in simplified form, of finding a conference room in the JNICC that has an area of less than 97 m^2 . (3)
- [33]

ANNEXURE E: QUESTION 5.3 JULIUS NYERERE INTERNATIONAL CONVENTION CENTRE FLOOR PLAN

JNICC GROUND FLOOR PLAN



KEY:

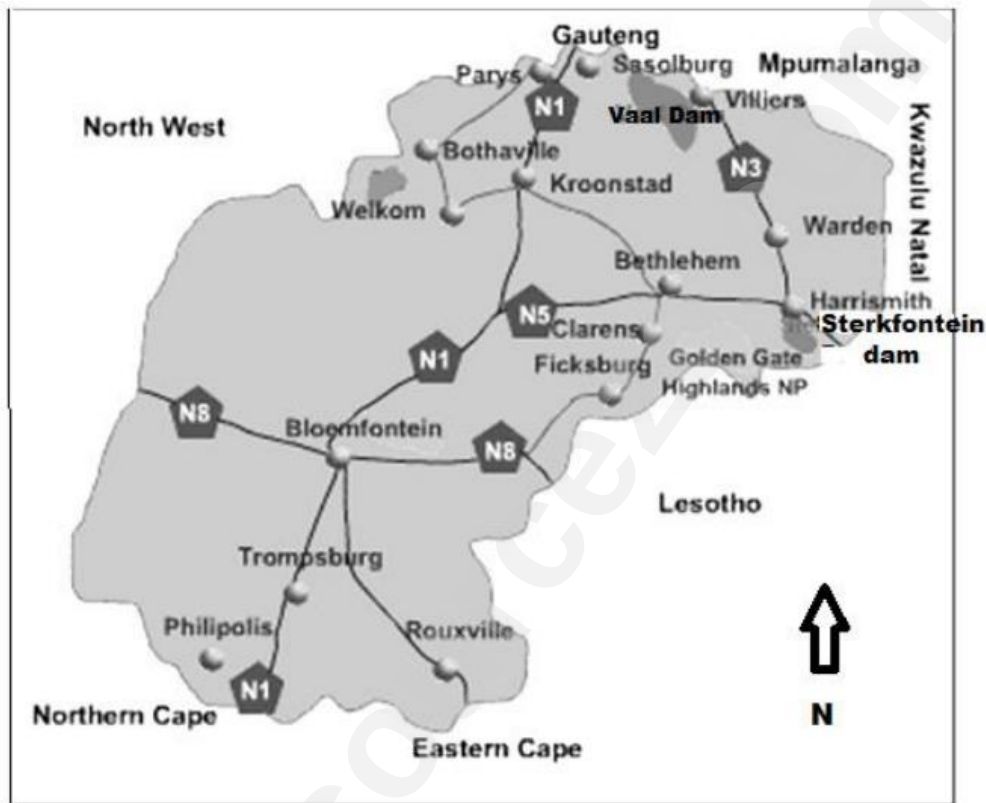
- | | | |
|---|--|--|
| 1. SELOUS HALL, AREA: 1138,5 m ² | 4. SAADANI ROOM, AREA: 98,43 m ² | 7. BUTIAMA VIP ROOM, AREA: 90 m ² |
| 2. RUAHA HALL, AREA: 380,2 m ² | 5. UDZUNGWA ROOM, AREA: 97,31 m ² | 8. MSASANI VIP ROOM, AREA: 90 m ² |
| 3. MKOMAZI HALL, AREA: 145,9 m ² | 6. MAFIA ROOM, AREA: 90,23 m ² | 9. VICTORIA LOBBY, AREA: 885 m ² |

[Adapted from <https://2018.foss4g.org>]

QUESTION 10 (INTERGRATED LEVE 1 QUESTIONS MAESUREMENTS AND MAPS)

Activity 1

- 1.1 Below is a map of the Free State province showing some towns/cities and roads. It also indicates neighbouring provinces and Lesotho, the neighbouring country.



[Source: www.researchgate.net]

NOTE: The N5 extends through Bethlehem to Harrismith

Use the map above to answer the questions that follow.

- 1.1.1 How many provinces can be seen on the map? (2)
- 1.1.2 Which town will you find next to the N1 on route from Bloemfontein to the Northern Cape? (2)
- 1.1.3 The area of the Free State is $129\,437\text{ km}^2$ which forms 10,6% of the area of the whole of South Africa. Calculate the area of the whole of South Africa. (3)
- 1.1.4 The Sterkfontein dam next to Harrismith has a length of 18,8 km. Convert this length to m. (2)

- 1.1.5 If the most eastern town on the map is Harrismith, name the most western town on the map. (2)
- 1.1.6 Which national road running through the Free State covers the longest distance? (2)
- 1.1.7 If a person travels from Harrismith to Bloemfontein via Ficksburg, which National road(s) will the person use? (2)
- 1.1.8 On 24 July 2021, Bloemfontein had a minimum temperature of -9°C and a maximum temperature of 8°C .
By how many degrees Celsius did the temperature rise? (2)
- 1.1.9 Is the following statement true or false?

The best scale to use on the map will be a bar scale. The reason is that if the map is enlarged, the bar scale will enlarge accordingly. (2)

- 1.2 The following is a picture of the Samsung S20 cell phone together with the dimensions of the cell phone.

PICTURE OF SAMSUNG CELLPHONE	DIMENSIONS OF CELLPHONE
	Length: 151,7 mm Width: 69,1 mm Thickness: 7,9 mm Weight (mass) = 163 g

[Source: deviceguides.vodafone.co.uk]

Use the information above to answer the questions that follow.

- 1.2.1 Determine the weight (mass) of 7 of these cell phones in kg. (2)

1.2.2 Which formula (A to D) can be used to calculate the perimeter of the Samsung S20 cell phone?

- A $\text{length} \times \text{width}$
- B $2 \times (\text{length} \times \text{width})$
- C $2 \times (\text{length} + \text{width})$
- D $\text{length} \times \text{width} \times \text{height}$ (2)

1.2.3 Sandile leaves his home exactly at the time displayed on the cell phone and arrives 2 hours later at his destination. Determine what time he reaches his destiny and write that time in words. (3)

1.2.4 Determine the difference between the width and the thickness of the cell phone (in mm). (2)

1.2.5 The Samsung S20 is available in the following colours: Grey, blue and white.

A customer can also choose between the following colours for a protective cell phone cover: Pink, blue, black and grey.

Write down the number of options a customer has when choosing a phone and a protective cover. (2)

[30]

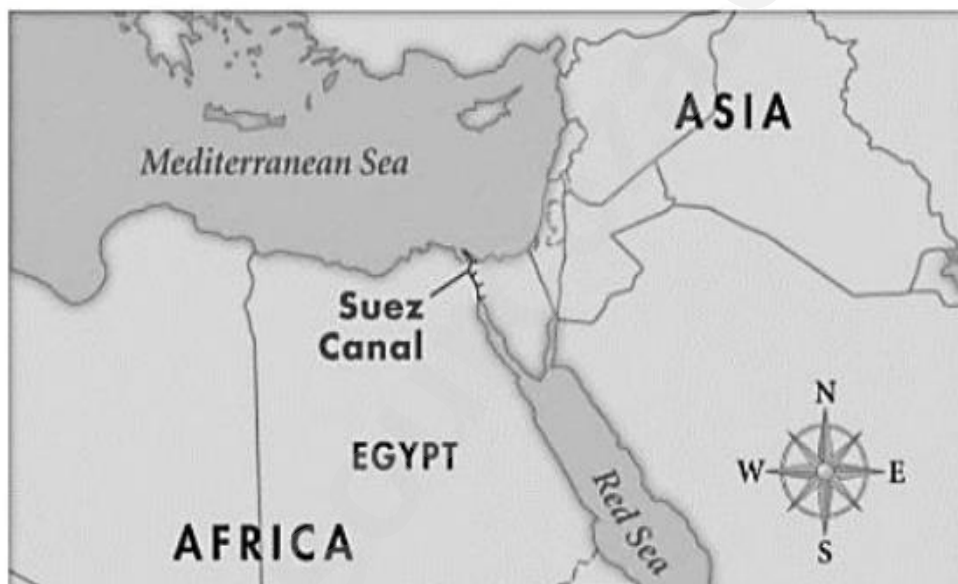
Activity 2

- 1.1 Study the information and the map below and answer the questions that follow.

The Suez Canal is an artificial sea-level waterway running 193 kilometres between Port Said in the north and Suez in the south. The Suez Canal offers a shorter route for major ships carrying cargo around the world. Construction of the Suez Canal started on 25 September 1859 and was first opened in 1869.

When first opened, the canal was 8 metres deep, 22 metres wide at the bottom and 61 to 91 metres wide at the surface. To allow ships to pass each other, passing bays were built every 8 to 10 km.

The map below shows the Suez Canal and its surrounding areas.



[Source: <https://kids.britannica.com/kids/article/Suez-Canal/353819>]

- | | | |
|-------|--|-----|
| 1.1.1 | Identify the country that borders the Suez Canal on the western side. | (2) |
| 1.1.2 | Write down the names of the continents separated by the Suez Canal. | (2) |
| 1.1.3 | Identify the sea that is found on the southern side of the Suez Canal. | (2) |
| 1.1.4 | Write down the distance between the city at the south of the Suez Canal and the city at the north of the Suez Canal. Give your answer in km. | (2) |
| 1.1.5 | Mention ONE advantage that ships have when using the Suez Canal. | (2) |

- 1.1.6 Mention any TWO items that a ship using the Suez Canal could transport. (2)
- 1.1.7 Give ONE reason why "passing bays" were built every 8 to 10 km along the length of the canal. (2)
- 1.1.8 Determine the number of years it took for the Suez Canal to be opened to maritime (sea-going) traffic from the time construction began. (2)
- 1.2 On 23 March 2020, the 1 300 ft long ship, the *Ever Given* travelled from Asia to Europe. It entered the Suez Canal in the south and sailed north. The ship got stuck in the mud right across the southern part of the canal.
- 1.2.1 In which general direction was the *Ever Given* sailing through the Suez Canal? (2)
- 1.2.2 At which city did the *Ever Given* enter the Suez Canal? (2)
- 1.2.3 The "Ever Given" is 1 300 ft. long. Convert the length of this container ship to metres, given that **1ft = 0,3048 m**. (2)
- 1.3 The chef on the ship prepared chocolate mousse for the crew members. Study the recipe below that he used and answer the questions that follow.

CHOCOLATE MOUSSE RECIPE

INGREDIENTS

200 g dark chocolate
30 ml brandy (optional)
3 eggs (whites only)
60 ml castor sugar
100 ml cream



Preparation time: 10 minutes

Cooking time: 5 minutes

Servings: 6 people

METHOD

- Grate 50 g dark chocolate, break the rest into small pieces and melt in a pot.
- Stir in brandy (if using).
- Whisk egg whites until stiff, add sugar and whisk until smooth.
- Fold in cream and add two thirds of the grated dark chocolate.
- Spoon the mixture into 6 bowls, sprinkle the remaining grated chocolate and chill in the fridge for 2 hours.

- 1.3.1 Determine the total time (in hours) that it will take to prepare and cook the chocolate mousse. (2)
- 1.3.2 Convert the weight of the dark chocolate to kilograms. (2)
- 1.3.3 Write down the ratio of castor sugar to brandy in its simplest form. (2)
- 1.3.4 Determine the number of grams of grated chocolate that will be added to the cream. (2)
- 1.3.5 The chef started making the mousse at 11:55. At what time will it be ready for eating? (2)
- [32]

Activity 3

1.1

The 2022 FIFA Soccer World Cup is being hosted in Qatar. TABLE 1 below shows the map and the capacity of the eight stadiums where the matches will be played. The stadiums are all within 40 miles of each other.

TABLE 1: LAYOUT MAP AND CAPACITY OF THE STADIUMS

	STADIUM	CAPACITY	 Scale 1:6 436 000
1	Al Bayt	60 000	
2	Lusail	86 250	
3	Al Rayyan	40 000	
4	Qatar Foundation	45 350	
5	Khalifa International	48 000	
6	Ras Abu Aboud	40 000	
7	Al Thumana	40 000	
8	Al Wakrah	40 000	

[Source www: thetimes.co.uk]

Use the information and TABLE 1 above to answer the following questions.

- 1.1.1 Name the stadium with the 3rd largest seating capacity. (2)
- 1.1.2 Determine the total capacity of all the stadiums. (2)
- 1.1.3 Identify the type of scale shown on the map. (2)
- 1.1.4 Write the number 6 436 000 in words. (2)
- 1.1.5 The stadiums are approximately 40 miles from each other.
Determine the approximate distance between the stadiums in km,
if 1 mile = 1,609 km. (2)

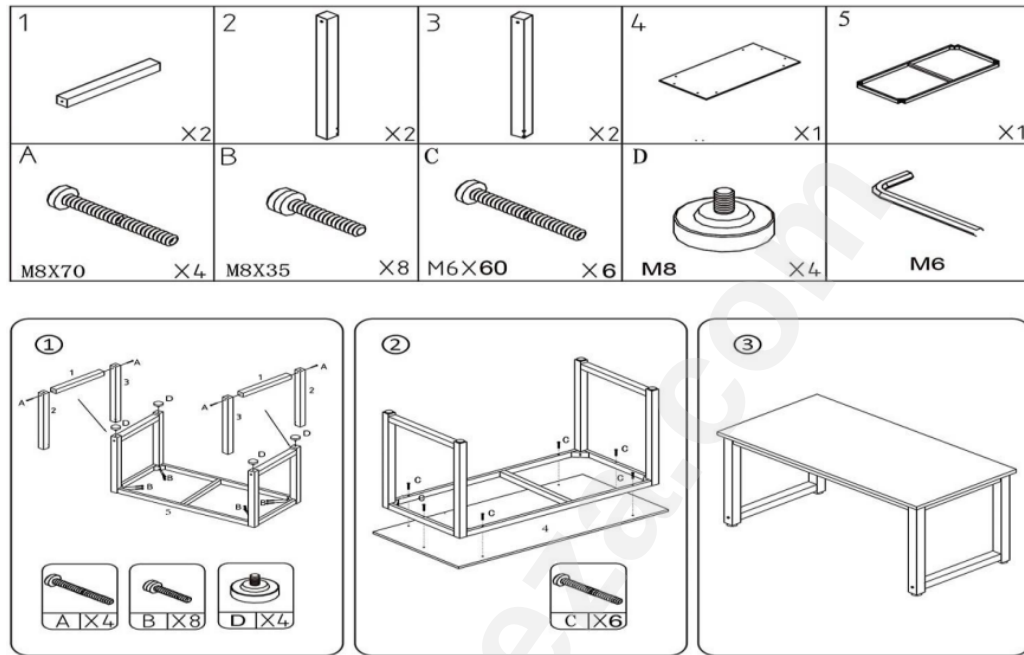
The opening match for the FIFA Soccer World Cup will be held on
21 November 2022 at 13:00 in Doha.

Use the information above to answer the following questions.

- 1.2.1 Determine the total number of days to the match starting from
27 September 2022. (2)
- 1.2.2 Determine if the starting time of the match is shown in 12 or 24-hour time
format. (2)
- 1.2.3 Write the start time of 13:00 in 12-hour format. (2)

1.3

The diagram below shows the assembly of a piece of furniture and the number of items required for assembly.



[Source www.ubuy.com]

Use the diagram above to answer the question that follow.

- 1.3.1 Identify the piece of furniture being assembled. (2)
- 1.3.2 Write down the number of legs this piece of furniture has. (2)
- 1.3.3 Write down the label of the item used to tighten the screws of this piece of furniture. (2)
- 1.3.4 Determine the total number of parts that make up the piece of furniture. (2)

1.4

The image below shows a pack of four Koo Baked Beans that is on special at a supermarket.

4 pack for R52,99	Dimensions of the can
	 Height = 11cm Radius = 3,5 cm

[Source: www.checkers.co.za]

Use the images and information above to answer the questions that follow.

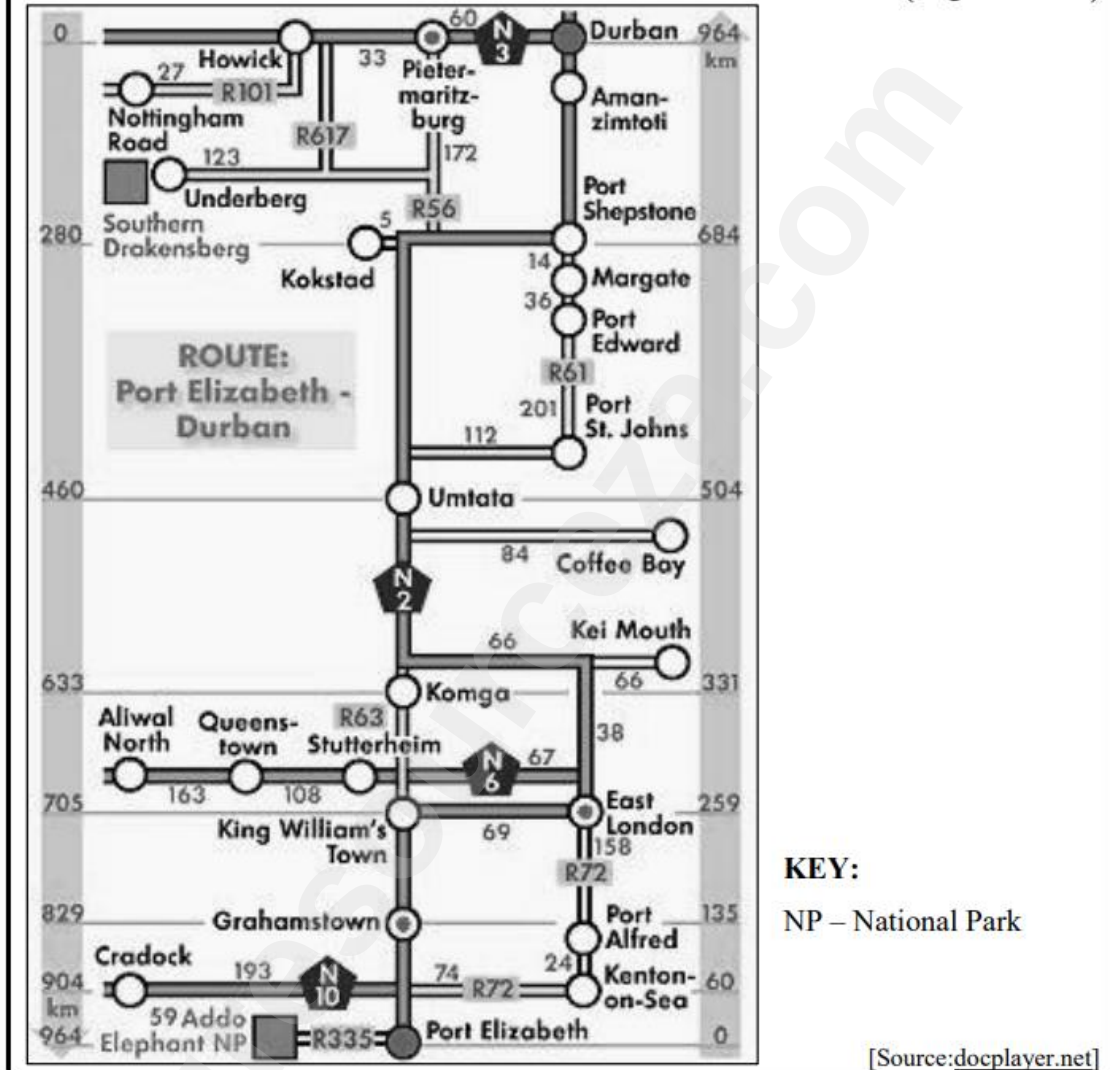
- 1.4.1 Calculate the unit cost of one can of Koo Baked Beans in the pack. (2)
- 1.4.2 Determine the mass in kilograms of one can of Koo Baked Beans. (2)
- 1.4.3 Determine the diameter of a can. (2)

[30]

Activity 4

- 1.1 Maria works in Durban and travelled to Port Elizabeth (Gqeberha) for her sister's wedding. She used the map, shown below, to guide her during the journey.

MAP OF A JOURNEY FROM DURBAN TO PORT ELIZABETH (GQEBERHA)



Use the map above to answer the questions that follow.

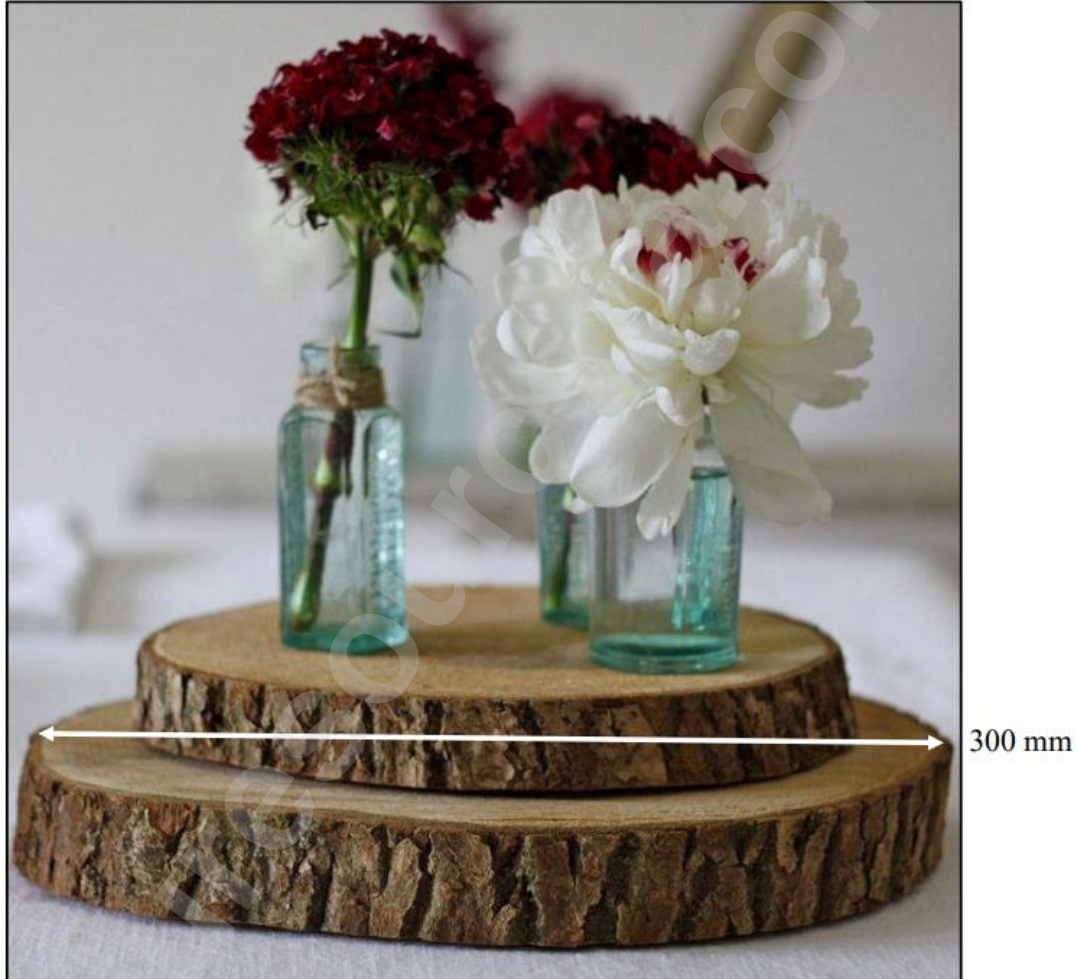
- 1.1.1 Identify the type of map used. (2)
- 1.1.2 Write down the name of the national road that connects Durban and Port Elizabeth. (2)
- 1.1.3 Determine the distance (in metre) between Port Elizabeth and Durban. (2)
- 1.1.4 Identify the last town Maria must drive through before reaching Port Elizabeth. (2)

1.1.5 Write down the names of any TWO regional roads appearing on the map. (2)

1.1.6 Identify the national park shown on the map. (2)

1.2 There were 200 guests at the wedding. Each table, seating 10 guests, was decorated with one centrepiece (table decoration), consisting of two wooden bases. Three glass bottles, each containing a flower, were placed on top of the upper wooden base.

PICTURE OF THE WEDDING'S CENTREPIECE (TABLE DECORATION)



[Source: FabMood.com]

Use the information above to answer the questions that follow.

1.2.1 Determine the number of flowers used on ONE table. (2)

1.2.2 Convert the length of the line going through the middle of the wooden base, as shown on the picture above, to centimetres. (2)

1.2.3 Hence, write down the term for the line going through the middle of the wooden base. (2)

1.2.4 State which shape (A, B or C) below is the shape of the wooden base.

- A. Triangular prism
- B. Cylinder
- C. Rectangular prism

(2)

1.2.5 The of the wooden base can be calculated using the formula, $2\pi r$.

(2)

- 1.3 Some of the wedding guests decided it will be quicker to fly and travelled to Port-Elizabeth in a Boeing 737 aircraft.

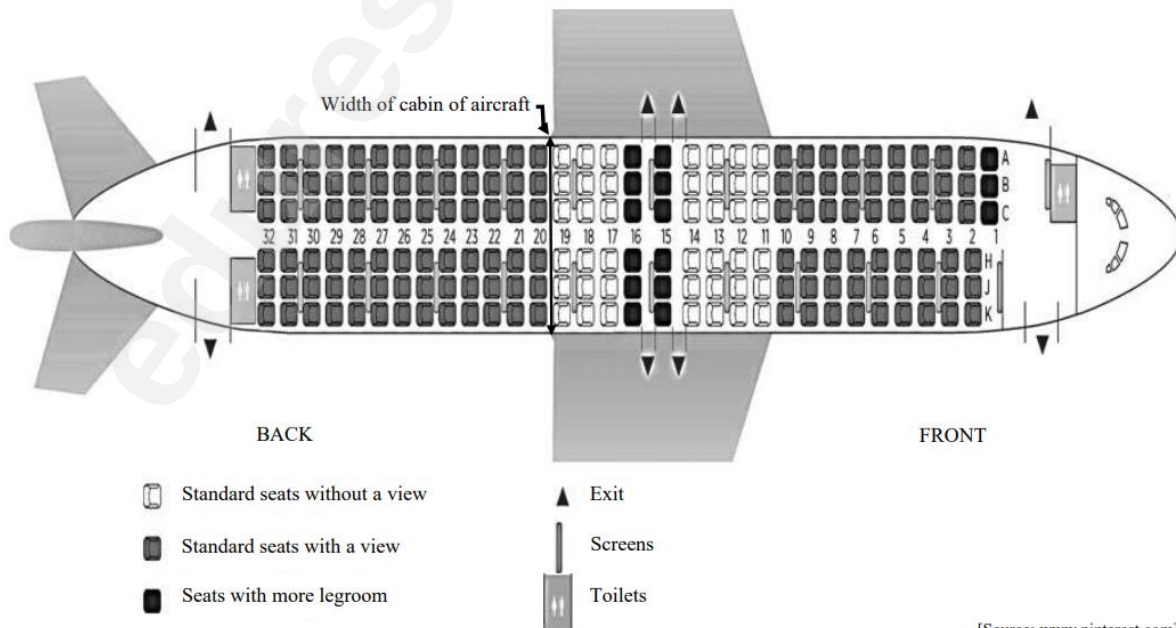
BOEING 737 AIRCRAFT



Use the layout of a Boeing 737 aircraft on ANNEXURE A to answer the questions that follow.

ANNEXURE A: LAYOUT OF A BOEING 737

QUESTION 1.3

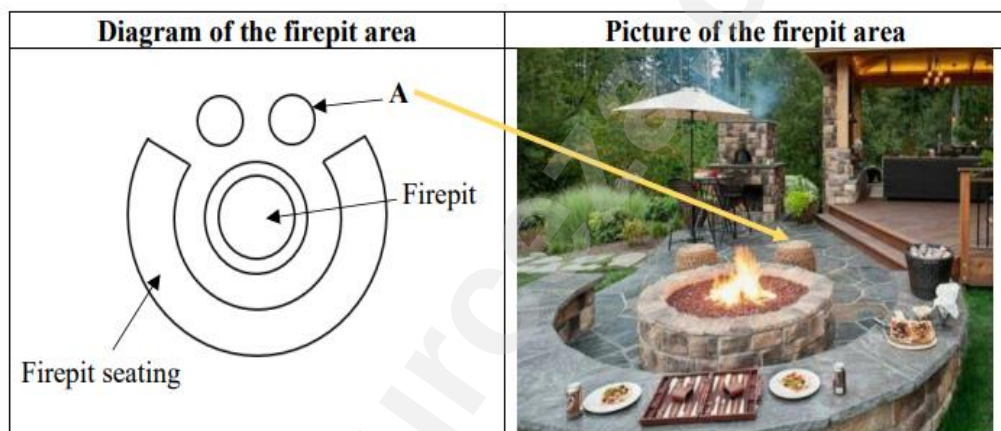


[Source: www.pinterest.com]

- 1.3.1 Measure (in cm) the width of the cabin of the aircraft. (2)
- 1.3.2 Determine the number of toilets on the aircraft. (2)
- 1.3.3 Write down whether seat C1 is at the FRONT or the BACK of the aircraft. (2)
- 1.3.4 Determine the number of seats with more legroom. (2)
- [30]

Activity 5

- 1.1 The van Harte family plans to extend their braai area by adding a firepit area.



[Adapted from source: www.renov8sa.co.za]

Use the information above to answer the questions that follow.

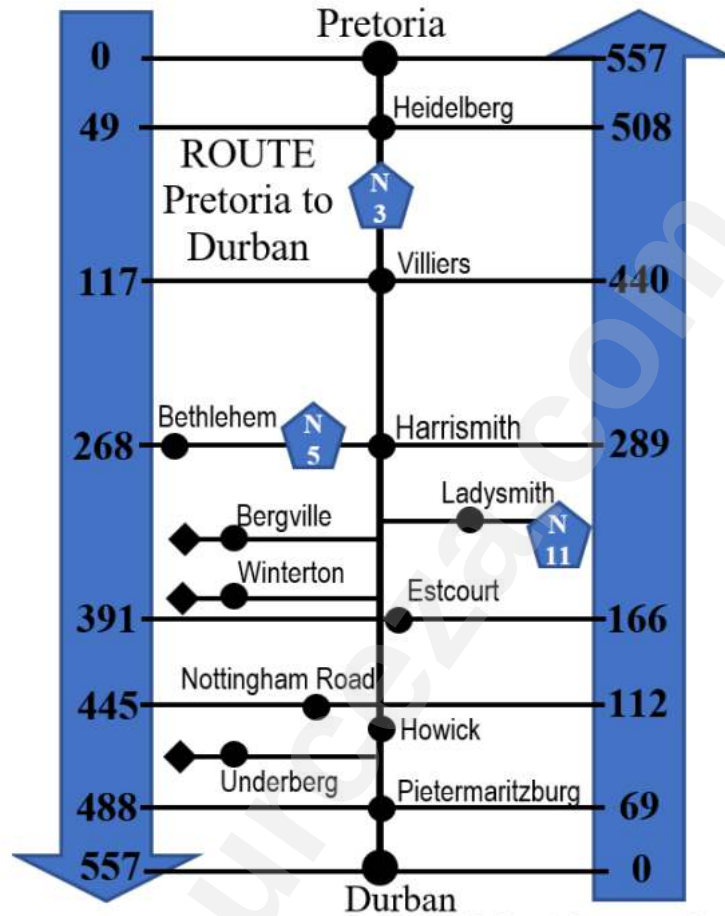
- 1.1.1 Identify the three-dimensional (3D) shape that is indicated by the letter A. (2)
- 1.1.2 The diameter of the firepit seating is 400 cm. Write down the radius in meters. (2)
- 1.1.3 The length of the firepit seating is $\frac{3}{4}$ of the circumference of a circle. Determine the length of the firepit seating if the circumference of the full circle is 8,5 meter. (2)
- 1.1.4 When they built the firepit, they filled it with concrete. Write down the formula from the list below that they will need to use if he wants to determine the amount of concrete needed.

$$\text{Volume} = \text{length} \times \text{breadth} \times \text{height}$$

$$\text{Volume} = \text{side} \times \text{side} \times \text{side}$$

$$\text{Volume} = \pi \times \text{radius}^2 \times \text{height} \quad (2)$$

1.2 The map below shows the route from Pretoria to Durban and vice versa.

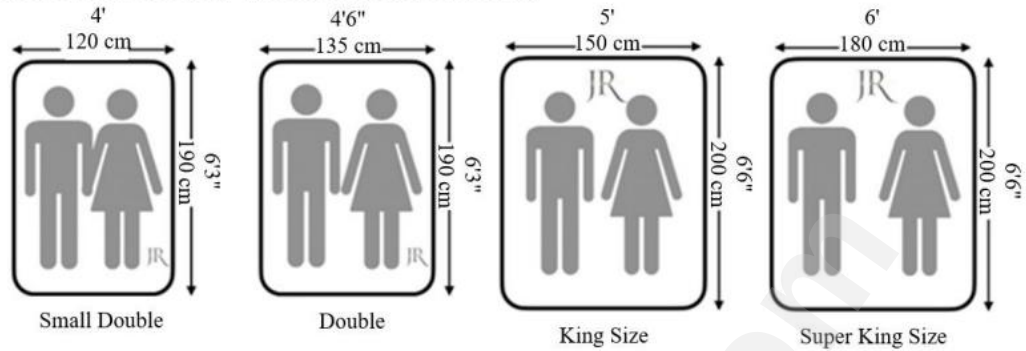


[Adapted from source: learn.mindset.africa]

Use the map above to answer the questions that follow.

- 1.2.1 Write down the type of map that is displayed above. (2)
- 1.2.2 Choose the letter A, B or C that does NOT apply to this type of chart.
 - A The chart is not drawn to scale.
 - B The roads are NOT displayed with straight lines.
 - C The actual distances are displayed. (2)
- 1.2.3 Write down the total distance from Pietermaritzburg to Pretoria. (2)
- 1.2.4 Write down the National roads to be used to travel from Pretoria to Bethlehem. (2)
- 1.2.5 A person drives from Bergville towards the N3. Write down whether that person has to turn left or right to drive to Pietermaritzburg. (2)

- 1.3 The following diagram shows 4 different sizes of beds in the United Kingdom with dimensions in cm as well as in feet and inches.



[source:johnryanbydesign.co.uk]

Use the diagram above to answer the questions that follow.

- 1.3.1 Write down the imperial dimension of the length of the small double bed in words. (2)
- 1.3.2 Write down in centimetre, the width of the king size to the width of the super king size beds as a simplified ratio. (3)
- 1.3.3 A bed company in South Africa wanted to see if the dimensions are 100% correct and did the calculation below:

Conversion factors:

1ft = 30,48 cm

1 inch = 2,54 cm

Calculations:

6 feet and 3 inches

$$= (6 \times 30,84) + (3 \times 2,54)$$

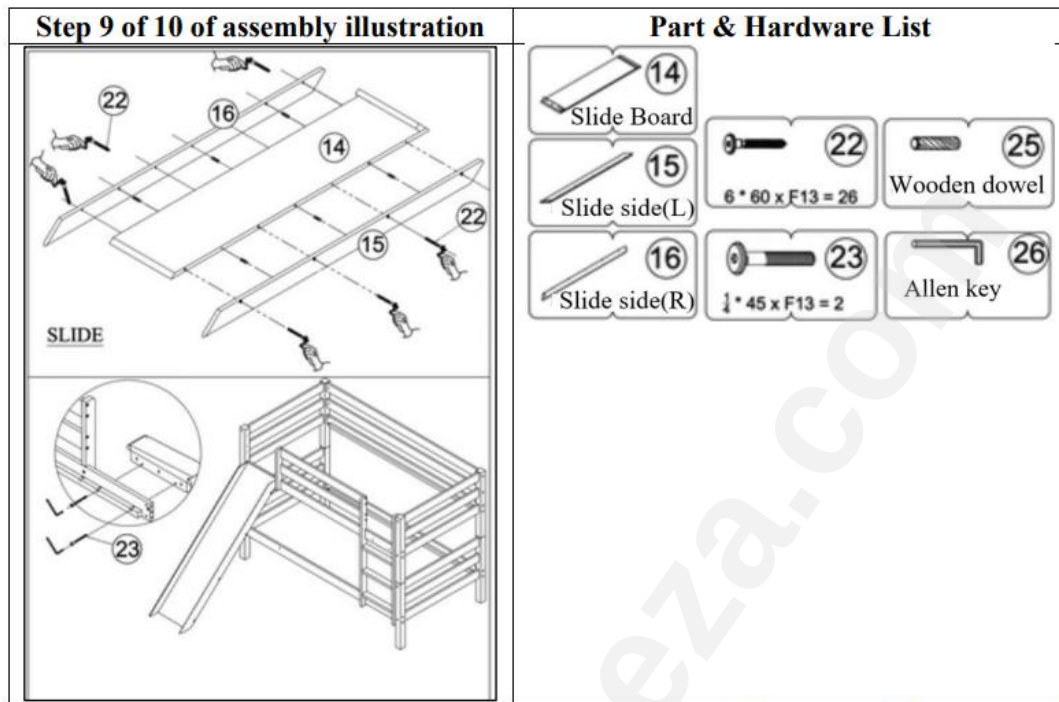
$$= 185,04 + 7,62$$

$$= 192,66 \text{ cm}$$

192,66 is 2,66 cm larger than the specified size.

Identify the mistake that they have made. (2)

Step 9 of 10 of the assembly instructions for the Kinsley and Olivia twin bunk beds with a slide is shown below.



[Adapted from customkidsfurniture.com]

Use the assembly illustration plus all relevant information to answer the questions that follow.

- 1.4.1 Identify the 3 parts that make up the slide. (3)
- 1.4.2 Write down the name of the tool that will be used to attach item 23. (2)