



eduresourceza.com

**MATHEMATICAL LITERACY
TRIALS PAPER 1**

Grade 12
Time: 3 hours

August 2021
Total: 150

Name/Exam number of candidate:

Marking grid: Teacher use only

Question 1	Question 2	Question 3	Question 4	
Basic skills	Finance – Income Tax	Finance – pricing, break- even, interest	Data Handling	TOTAL:
/30	/18	/50	/52	/150

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY

- Please write your name (or exam number) in the block above.
- This question paper consists of 20 pages (including this cover page and two pages of extra space at the end) and a separate appendix (3 pages). Please check that your paper is complete.
- All questions are to be answered **on this question paper**. There is extra space provided at the back if required.
- You may use an approved non-programmable and non-graphical calculator, unless otherwise stated.
- Round off your answers to **2 decimal digits** where necessary, unless otherwise stated.
- All the necessary working details must be clearly shown.
- It is in your interest to write legibly and to present your work neatly.

Question 1

The 2020 Olympics were held in Japan in July and August of 2021 (they were postponed from 2020 due to COVID-19).

The graphic on **Appendix A** shows which countries have been in the Top 6 of the Olympic Games from 1996 to 2020. Russia is now known as ROC for the purposes of competing in the Olympics.

Use the graphic to answer the questions that follow.

- 1.1 Which country has won the most Olympic Games from 1996 to now, and how many times have they won it? (2)

- 1.2 Which countries were in the top 6 in 1996, but did not finish in the top 6 in 2020? (2)

- 1.3 Comment on Germany's performance in the Olympic Games from 1996 to 2020. (3)

- 1.4 Name a country that has only appeared in the top 6 once from 1996 – 2020. (2)

- 1.5 Which country had a good 2020 Olympics and why? (2)

One of the countries competing in the Olympics is Canada. Some facts about Canada are shown below:



Canada

#1 in Quality of Life Rankings

No Change in Rank from 2020

Canada takes up about two-fifths of the North American continent, making it the second-largest country in the world after Russia. The country is sparsely populated, with most of its 35.5 million residents living within 125 miles of the U.S. border. Canada's expansive wilderness to the north plays a large role in Canadian identity, as does the country's reputation of welcoming immigrants.

GDP
\$1.74 trillion

POPULATION
37.6 million

Source: <https://www.usnews.com/news/best-countries/quality-of-life-rankings>

- 1.6 A trillion is a million million. Write Canada's GDP (gross domestic product) as a number. (2)

- 1.7 GDP per capita is the total GDP of a country, divided by the population of that country. Calculate the GDP per capita of Canada. Round your answer to the nearest whole number. (4)

- 1.8 Approximately 7,2 million people in Canada are French speaking. Express the proportion of French-speaking Canadians as a percentage. Round your answer to one decimal place. (3)

- 1.9 The population in Canada is expected to grow at a rate of 1,4%. What will the population of Canada be one year from now? (2)

- 1.10 Susan wants to order an Olympic T-shirt from Canada. The price of the shirt is \$45. (2)
What will the shirt cost in Rands, if the exchange rate is \$1 = R14,87?

- 1.11 In Canada, a sales tax of 13% must be added to all items. What will a \$62 shirt cost (3)
(in dollars), once the sales tax is added to it?

- 1.12 Susan finds another T-shirt on special offer. The normal price of the T-shirt is R750, but there is a 20% discount. What is the new price of the T-shirt? (3)

[30]

Question 2

Marianne (37 years old) lives and works as a chiropractor in Pietermaritzburg. Her take-home salary (what she receives in her bank account) at the end of each month is R21 638.

Marianne has been offered a new job as a chiropractor in a medical practice in Hilton. The new job offer states the following:

- Gross annual salary: R360 000
- UIF of 1% of monthly salary will be deducted (a maximum amount of R148,72 may be deducted when calculating taxable income)
- Pension Fund: R1 500 per month (this full amount may be deducted when calculating taxable income)

2.1 Calculate Marianne's **monthly** taxable income (Gross salary – deductions). (2)

-
- This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. A faint, diagonal watermark reading "edureson" is visible across the center of the page. There are no margins or other markings present.

- 2.4 Based on the calculations above, should Marianne accept the job offer? Why or why not? (2)

- 2.5 Give TWO considerations, other than salary, that Marianne might take into account when deciding whether or not to accept the job offer. (2)

[18]

Question 3

Sandiswa and Taryn decide to open a delivery-only restaurant called **Food2u**.

They work out the following menu for August:

<u>Starters</u>	<u>Main Course</u>	<u>Dessert</u>
Winter warmer soup	Roast Chicken & veg	Ice cream
Halloumi salad	Pulled Pork wrap	Brownies
	Grilled Kabeljou	Apple pie
	Vegetable stack	

3.1 Sandiswa is trying to work out the probability of a customer choosing particular options.

3.1.1 Calculate the probability that a customer who is choosing a starter at random, selects the Halloumi salad. (2)

3.1.2 Calculate the probability that a customer who is choosing a main course at random, selects the Pulled Pork wrap. (2)

3.1.3 Calculate the probability that a customer who is choosing a three-course meal, selects the option Halloumi Salad, Pulled Pork wrap, Brownies. (4)
(Assume that all combinations have an equal chance of being selected)

- 3.2 Taryn is working out various cost prices and selling prices. (10)
The girls are using a recipe to make their Brownies. The recipe, prices they found from Pick n Pay and useful conversions are shown on **Appendix C**.

Help the girls by completing the missing information in the table below, and hence calculate the cost price of one Brownie. Show all workings.

Ingredient	Cost per quantity required for recipe
Butter	R37,22
Sugar	
Cocoa powder	R20,75
Vanilla extract	
Eggs	R10,66
All-purpose flour	
Baking powder	R1,60
Salt	R0,06
Walnut halves	R22,00
TOTAL cost to make the recipe:	
TOTAL cost per brownie	

- 3.3 In order to finance their business, the girls take out a loan from Fast Finance, a microlender. After three months, they receive the following financial statement from the lender:

FAST FINANCE STATEMENT			
Customer: Food2u			
DATE	TRANSACTION	AMOUNT	BALANCE
2021/01/01	Opening balance		R20 000
2021/02/28	Debit: interest	R383,33	R20 383,33
2021/02/28	Administrative fee	R29	R20 412,33
2021/02/28	EFT: credit	-R800	R19 612,33
2021/03/31	Debit: interest	A	B
2021/03/31	Administrative fee	C	D
2021/03/31	EFT: credit	E	F

- 3.3.1 Determine the **annual** interest rate as a percentage (round off to a whole number). (4)

- 3.3.2 The same amount of interest is charged every month. What type of interest has Fast Finance applied to this loan? (2)

- 3.3.3 Determine the values A-F in the table. (6)

- 3.3.4 The loan will be paid off in 52 instalments. The last instalment will be R228,83. Calculate the total amount that the girls will pay back over the course of the loan. (3)

- 3.4 Food2u is getting quotes from drivers to deliver food to their customers. These quotes are as follows:

- Caddy's Cars will deliver items for a price of R6 per kilometre.
- Bradley's Bikes charges R100 per day for the first 30 kilometres and charges R10 per kilometre thereafter.

- 3.4.1 Use the information above to complete all missing values in the table: (7)

Distance (km)	0	20	30		80
Caddy's Cars	0	120	180		480
Bradley's Bikes	100	100		270	

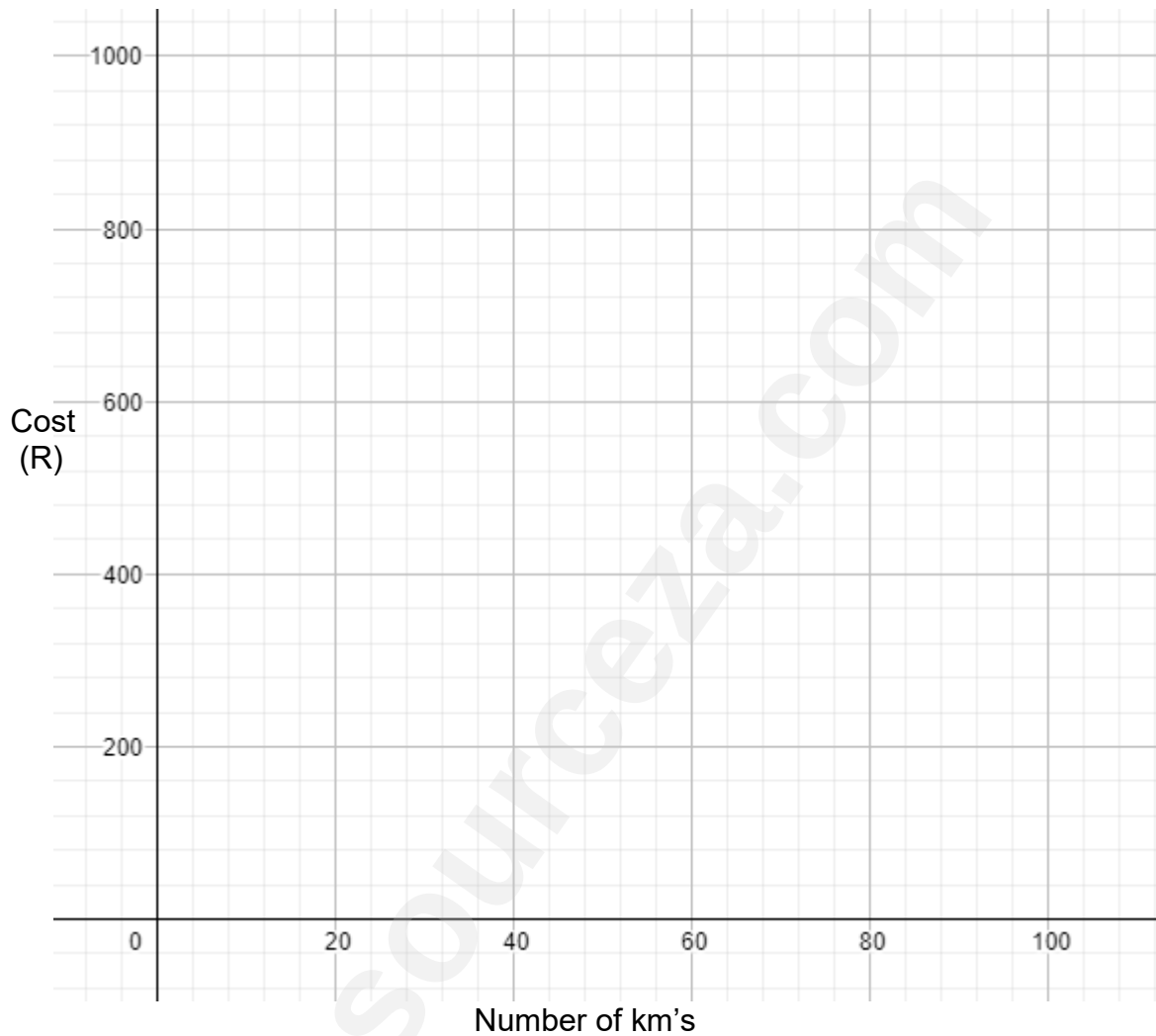
Workings:

Working:

- 3.4.2 On the grid below, draw a graph representing costs for Caddy's Cars and a graph representing costs for Bradley's Bikes.

(5)

Graph showing delivery cost options



- 3.4.3 If there are deliveries covering 35km, which option will be cheaper? Explain how you know.

(2)

- 3.4.4 For which range of kilometres will it be cheaper to use Bradley's Bikes? (You may read approximate values from your graph or do calculations to substantiate your answer)

(3)

[50]

Question 4

4.1 The following women have been named the greatest female Olympic athletes. (This data was compiled before the 2020 Olympic Games started)

WOMEN – ALL EVENTS			<u>Gold</u>	<u>Silver</u>	<u>Bronze</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8 Medals</u>	<u>Points</u>
1,	Allyson Felix	USA	6	3	-	-	1	-	-	-	9 73
2,	Merlene Ottey/Page	JAM	-	3	6	1	1	1	-	1	9 70
3,	Veronica Campbell-Brown	JAM	3	3	2	1	-	-	-	-	8 62
4,	Shirley Strickland	AUS	3	1	3	1	1	-	-	-	7 58
5,	Irena Kirszenstein/Szewińska	POL	3	2	2	-	-	-	-	-	7 50
6,	Gwen Torrence	USA	3	1	1	1	1	1	-	-	5 49
7,	Jackie Joyner-Kersey	USA	3	1	2	-	1	-	-	-	6 47
=8,	Evelyn Ashford	USA	4	1	-	-	1	-	1	-	5 45
	Sanya Richards-Ross	USA	4	-	1	-	1	1	-	-	5 45
	Raelene Boyle	AUS	-	3	-	2	2	2	-	-	3 45
11,	Renate Stecher	GDR	3	2	1	-	-	-	-	-	6 44

Source: tokyo-2020-olympic-games-statistics-handbook1.pdf

Points are awarded as follows: 8 points are awarded for first place (Gold) down to 1 for eighth. Available points are shared for those involved in ties.

4.1.1 Show how Allyson Felix's points were calculated: (4)

4.1.2 Why do the ratings jump from 8th place (Evelyn Ashford, etc.) to 11th place? (2)

4.1.3 Explain why Gwen Torrence is rated higher than Jackie Joyner-Kersey even though she has won fewer medals. (2)

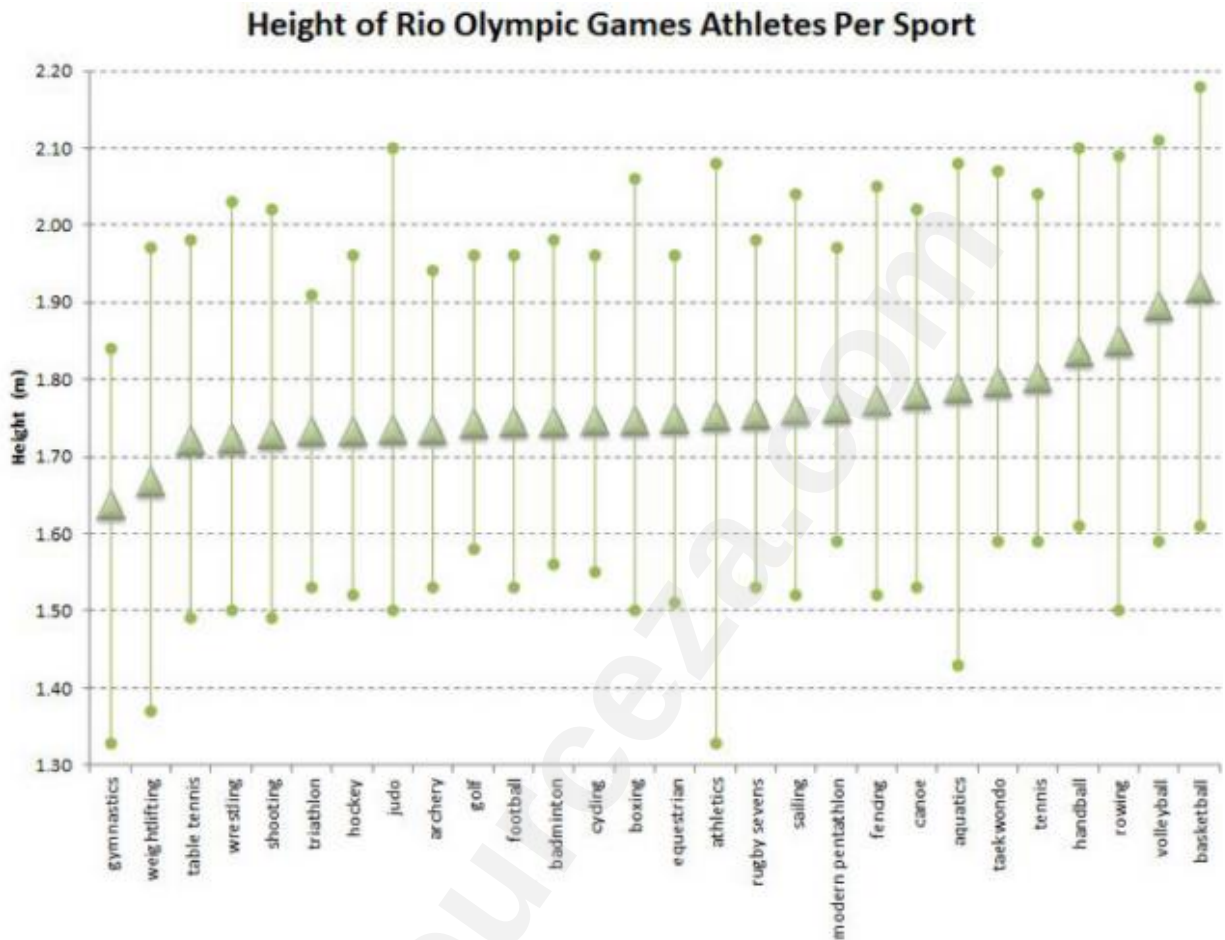
- 4.1.4 Calculate the mean (average) number of points scored by the 11 women in this list. (3)

- 4.1.5 Determine the modal number of points. (2)

- 4.1.6 Determine the median number of points. (2)

- 4.1.7 If a fantastically talented new female athlete competed in the Olympic Games, and scored 85 points, describe the impact that this would have on the mean, median and mode (you do not need to re-calculate any values). (3)

- 4.2 The Grade 12 learners are curious about the height of Olympic athletes. They find the following graph that shows the minimum, maximum and average (mean) heights of athletes in various sports.



<https://www.topendsports.com/>

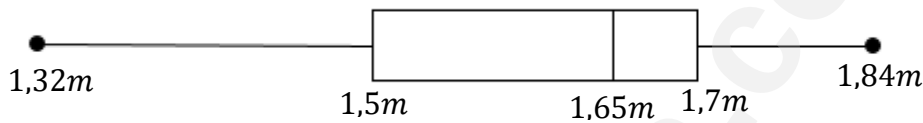
- 4.2.1 Which two sports had the tallest athletes? (2)

- 4.2.2 Which sport had the lowest mean height? (2)

- 4.2.3 Which sport had the biggest range of athlete heights? Calculate an approximate value for this range. (3)

- 4.2.4 The average human being has a height of 1,65m. How do the heights of Olympic athletes compare to average human beings? Why do you think it is so? (2)

- 4.2.5 The heights of athletes competing in Gymnastics is shown in a box and whisker plot below:



- 4.2.5.1 Determine the interquartile range. (2)

- 4.2.5.2 Are there more gymnasts with a height less than 1,65m or more gymnasts with a height greater than 1,65m? Explain your answer. (2)

- 4.2.6 Name two sports (other than Gymnastics) where the heights are not evenly spread. (2)

4.2.7 Kevin Durant is regarded as the best Basketball player at the Tokyo Olympics. He is 2,08m tall.

4.2.7.1 Determine Kevin Durant's height in feet and inches (e.g. 5 feet 3 inches), if 1 metre = 3,28 feet and 1 foot = 12 inches. Round your answer to the nearest inch. (4)

4.2.7.2 One of the Grade 12 learners enters Kevin Durant's height into an online calculator. The results are shown below: (2)

Units: ☒ Imperial ☐ Metric

Gender: ☒ Male ☐ Female

Age:

Height: feet inches

Country:

Average: feet inches

SD: inches



Calculate

Extremely Tall
99.999 Percentile

<https://tall.life/height-percentile-calculator-age-country>

If you picked a random group of 200 000 adult males from the United States, how many of them would be shorter than Kevin Durant?

4.2.8 At what percentile would a male from the US be, if they were 5 feet and 9,3 inches tall? (2)

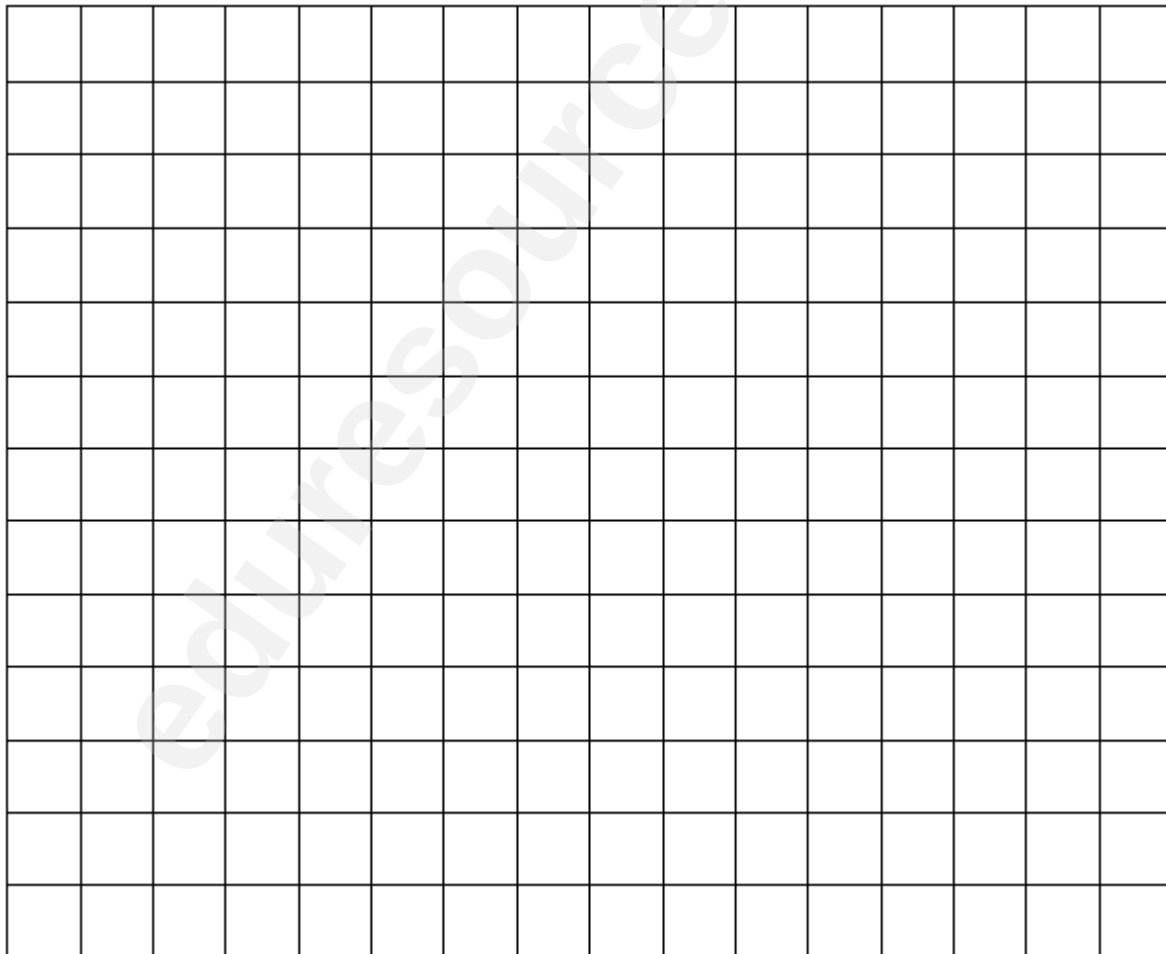
- 4.3 The table below shows the final results for the Tokyo Olympic Games. Only the top 5 countries are shown. (10)

Country	G	S	B
 United States	39	41	33
 China	38	32	18
 Japan	27	14	17
 Great Britain	22	21	22
 ROC	20	28	23

Source: insidethegames.biz

The United States won the greatest total number of medals, 113. Of those, 39 were gold medals, 41 were silver medals and 33 were bronze medals.

Draw a stacked bar graph on the grid below, showing the total number of medals won by each of the top 5 countries. Each bar must show the total number of medals, and be broken down by gold, silver and bronze.



EXTRA LINED PAPER IN CASE YOU NEED MORE SPACE. Number your answers clearly.

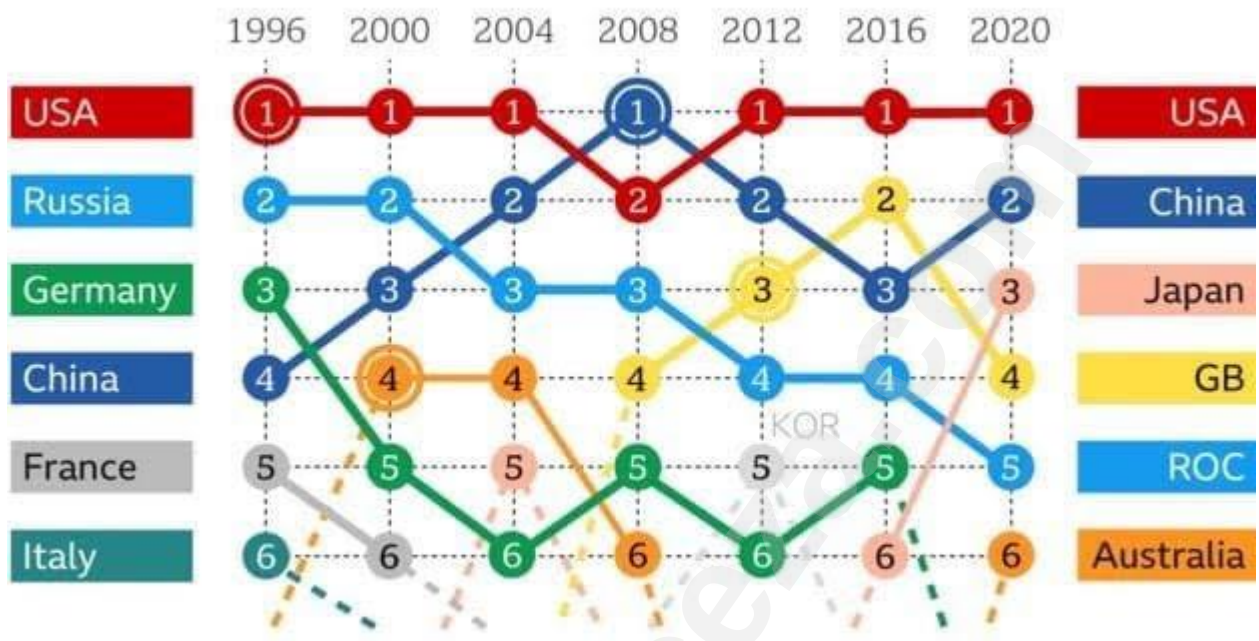
20 horizontal lines for writing answers.

eduresourceza.com

APPENDICES

Appendix A

○ = Host nation



Source: Nielsen Gracenote

Appendix B

RATES OF TAX FOR INDIVIDUALS

2021 tax year (1 March 2020 - 28 February 2021)

Taxable income (R)	Rates of tax (R)
1 – 205 900	18% of taxable income
205 901 – 321 600	37 062 + 26% of taxable income above 205 900
321 601 – 445 100	67 144 + 31% of taxable income above 321 600
445 101 – 584 200	105 429 + 36% of taxable income above 445 100
584 201 – 744 800	155 505 + 39% of taxable income above 584 200
744 801 – 1 577 300	218 139 + 41% of taxable income above 744 800
1 577 301 and above	559 464 + 45% of taxable income above 1 577 300

Tax Rebates

Primary Rebate	R14 958
Secondary Rebate (Persons 65 & Older)	R8 199
Tertiary Rebate (Persons 75 & Older)	R2 736

Tax Thresholds

Under 65	R83 100
65 and older	R128 650
75 and older	R143 850

(Reference: <https://www.sars.gov.za/Tax-Rates/IncomeTax/Pages/Rates%20of%20Tax%20for%20Individuals.aspx>)

Appendix C

Brownie recipe**Makes 20 Brownies****1 cup butter****2 cups white sugar** **$\frac{1}{2}$ cup cocoa powder****1 teaspoon vanilla
extract****4 eggs** **$1\frac{1}{2}$ cups all-purpose flour** **$\frac{1}{2}$ teaspoon baking powder** **$\frac{1}{2}$ teaspoon salt** **$\frac{1}{2}$ cup walnut halves**

Source: allrecipes.com

Prices

- Butter (500g) R81,99
- Sugar (10kg) – R180,99
- Cocoa powder (125g) – R41,49
- Vanilla extract (50ml) – R135,99
- Eggs (pack of 6) – R15,99
- All-purpose flour (2,5kg) – R31,99
- Baking powder (15g) – R9,99
- Salt (500g) – R9,99
- Walnuts Halves (100g) – R43,99

Source: pnp.co.za

Useful conversions:

1 cup butter = 227 grams

1 cup sugar = 200 grams

1 cup cocoa powder = 125 grams

1 cup flour = 125 grams

1 cup walnut halves = 100 grams

1 teaspoon vanilla extract = 4,9 ml

1 teaspoon baking powder = 4,79 grams

1 teaspoon salt = 5,9 grams