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NATIONAL SENIOR CERTIFICATE EXAMINATION
NOVEMBER 2021

MATHEMATICAL LITERACY: PAPER I

MARKING GUIDELINES

Time: 3 hours

150 marks

These marking guidelines are prepared for use by examiners and sub-examiners, all of whom are required to attend a standardisation meeting to ensure that the guidelines are consistently interpreted and applied in the marking of candidates' scripts.

The IEB will not enter into any discussions or correspondence about any marking guidelines. It is acknowledged that there may be different views about some matters of emphasis or detail in the guidelines. It is also recognised that, without the benefit of attendance at a standardisation meeting, there may be different interpretations of the application of the marking guidelines.

Q1	Marking guideline	Skills assessed	Topic	Level
KEY	a accuracy m method mca method continued accuracy Answers only full marks	ca continued accuracy ma method accuracy r rounding	F Finance D Data handling P Probability	1 KN 2 RP 3 MSP 4 R&R
1.1.1	JHB, CPT & DBN if extra cities added -1 for each city	must have all three cities	F	1
1.1.2	(a) Upfront or full amount; prepaid; once off (b) Monthly or 30 days	Upfront Monthly	F	1
1.1.3	R14 000	R14 000	F	1
1.1.4	R81 894 + R14 000 + R1950 = R97 844	adding correct three values	F	1
1.1.5	$\frac{R14\,000}{R97\,844} \times 100 = 14,31\% \text{ or } 14,3\% \text{ or } 14\%$	dividing by R97 844 correct percentage	F	1
1.1.6	On or before 31 March 2021 Or 31 March Or 31/03	31 March	F	1
1.1.7	Savings = R102 755 – R97 844 = R4 911 Alternative solutions Savings = R86 805 – R81 894 = R4 911	subtracting R97 844 correct answer subtracting R81 894 correct answer	F	1
1.2.1	(a) Rent or Cellphone or transport (b) Food; toiletries, Cellphone, Entertainment, Transport (c) Doctor/Dentist	(a) Rent or Cellphone or transport (b) one from this list (c) Doctor/Dentist	F F F	1 1 1
1.2.2	(a) R6 000 – R2 200 – R1 800 – R400 – R300 – R150 – R300 – R300 = R550 (b) surplus	(a) R6000 subtract values all correct values used (b) surplus	F F	1 1
1.2.3	R1 : ~~R~~ 26,0496	correct currency symbol correct value	F	1

Q1	Marking guideline	Skills assessed	Topic	Level											
KEY	a accuracy m method mca method continued accuracy	ca continued accuracy ma method accuracy r rounding	F Finance D Data handling P Probability	1 KN 2 RP 3 MSP 4 R&R											
1.3.1	Discrete data involves certain, round, concrete numbers that are determined by counting. Continuous data involves complex or rational numbers that are measured. or if an example was given showing that measurement took place.	numbers that are counted numbers that are measured	D	1											
1.3.2	Minimum = \$963 420 425 Maximum = \$2 797 800 564	min correct max correct	D	1											
1.3.3	<table border="1"><thead><tr><th>Worldwide Gross Earnings</th></tr></thead><tbody><tr><td>\$2 797 800 564</td></tr><tr><td>\$2 065 478 084</td></tr><tr><td>\$2 044 540 523</td></tr><tr><td>\$1 654 409 423</td></tr><tr><td>\$1 396 099 202</td></tr><tr><td>\$1 236 703 796</td></tr><tr><td>\$1 151 918 521</td></tr><tr><td>\$1 072 944 222</td></tr><tr><td>\$1 045 663 875</td></tr><tr><td>\$ 963 420 425</td></tr></tbody></table> order correct	Worldwide Gross Earnings	\$2 797 800 564	\$2 065 478 084	\$2 044 540 523	\$1 654 409 423	\$1 396 099 202	\$1 236 703 796	\$1 151 918 521	\$1 072 944 222	\$1 045 663 875	\$ 963 420 425	R 1 396 099 202 position correct. order correct Only 1 mark if all correct but in ascending order.	D	1
Worldwide Gross Earnings															
\$2 797 800 564															
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\$1 654 409 423															
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\$1 236 703 796															
\$1 151 918 521															
\$1 072 944 222															
\$1 045 663 875															
\$ 963 420 425															
1.3.4	One billion six hundred and fifty-four million four hundred and nine thousand four hundred and twenty three. Alternative solution If the wrong number is used and correctly written in words.	correct words wrong number but correct words	D	1											

Q2	Marking guideline	Skills assessed	Topic	Level
KEY	a accuracy m method mca method continued accuracy	ca continued accuracy ma method accuracy r rounding	F Finance D Data Handling P probability	1 KN 2 RP 3 MSP 4 R&R
2.1.1	$R11\ 099 \times 10\% = R1109,90$	Multiply by 10% R1109,90	F	1
2.1.2	Price excl. VAT = $\frac{R11\ 099}{1,15} = R9651,30$ VAT = $R11\ 099 - R9651,30 = R1\ 447,70$ No marks $R11\ 099 \times 15\% = R1664,85$ Alternative answers Price excl. of VAT = $\frac{R11\ 099}{115\%} \times 15\% = R1\ 447,70$ Or Price excl. VAT = $\frac{R11\ 099}{1,15} = R9651,30$ VAT = $R9651,30 \times 15\% = R1447,70$	divide by 1,15 R9651,30 R1447,70 divide by 115% Multiply by 15% R1447,70 divide by 115% Multiply by 15% R1447,70	F	2
2.1.3	$36 \div 12 = 3$ years Answer only = 3 years	dividing by 12 3 years	F	1
2.1.4	Total = $R564,23 \times 36 + R1109,90 = R21\ 422,18$ Or Total = $R20312,28 + R1109,90 = R21\ 422,18$	multiplying by 36 add deposit R1109,90 R21 422,18	F	2
2.1.5	Interest = $R21\ 422,18 - R11\ 099 = R10\ 323,18$	using answer from 2.1.4 subtracting R11 099 R10 323,18	F	2

Q2	Marking guideline	Skills assessed	Topic	Level
KEY	a accuracy m method mca method continued accuracy	ca continued accuracy ma method accuracy r rounding	F Finance D Data Handling P probability	1 KN 2 RP 3 MSP 4 R&R
2.2.1	(a) $\text{mean} = \frac{8\,506}{13} = 654,31 \text{ or } 654,3 \text{ or } 654$ Wrong data mean = $\frac{3641}{10} = 364,1$ Answer only full marks (b) 13; 83; 122; 333; 448; 594; 668; 769; 1 004; 1 028; 1 054; 1 175; 1 215 median = 668 (c) Range = 1215 – 13 = 1202	adding values dividing by 13 654,31 Wrong data correctly used 2 marks order 668 Wrong data correctly used 1 mark subtract 13 from 1 215 1202 Wrong data correctly used 1 mark	D D D	2 2 2
2.2.2	The median as the low values of 13 & 83 are outliers and these lower the mean.	medium low values 13 & 83 lower the mean	D	4
2.2.3	The number of arrests has generally increased up until 2016. Although the effect was not immediate the number of rhinos poached has come down from its peak in 2014. This indicates that the arrests have had a positive effect on rhino poaching.	arrests have increased rhinos poached decrease correct values used	D	4

Q3	Marking guideline	Skills assessed	Topic	Level
KEY	a accuracy m method mca method continued accuracy	ca continued accuracy ma method accuracy r rounding	F Finance D Data Handling P probability	1 KN 2 RP 3 MSP 4 R&R
3.1	Instagram = $100 - 7,5 - 5 - 4,5 - 4,4 - 2,7 - 10,7 - 29,3 - 25,3$ Instagram = 10,6% Answer only = 10,6%	subtracting values 10,6%	D	2
3.2	$29,3\% \times 360 = 105,48^\circ$	Correct sector multiplying by 360 105,48°	D	2
3.3	$P(\text{Reddit}) = 4,4\%$ or 0,044 or $\frac{4,4}{100}$ or $\frac{44}{1000}$ or $\frac{11}{250}$	4,4% from pie chart	P	1
3.4	YouTube users = $25,3\% \div 29,3\% \times 2\,000\,000\,000$ YouTube users = 1 726 962 457 YouTube users $\approx 1\,727\,000\,000$ or 1727 million Alternative answers YouTube users = $25,3\% \times 2\,000\,000\,000 \div 29,3\%$ YouTube users = 1 726 962 457 YouTube users $\approx 1\,727\,000\,000$ YouTube users = $25,3\% \div 29,3\% \times 2\,000\,000\,000$ YouTube users = 86,3481% $\times 2\,000\,000\,000$ YouTube users = 1 726 962 457 YouTube users $\approx 1\,727\,000\,000$	dividing 25,3% by 29,3% multiplying writing 2 billion correctly 1 726 962 457 1 727 000 000 rounding correct	F	3
3.5	(a) Pie charts are useful for displaying data that is classified into categories. A pie chart is also very good at showing how each category contributes to the whole.	each category contributes to the whole	D	4
	(b) Categorical data as the pie chart shows the names of different social media websites	Categorical data shows different social media websites	D	1

Q4	Marking guideline	Marks	Skills assessed	Topic	Level
KEY	a accuracy m method mca method continued accuracy		ca continued accuracy ma method accuracy r rounding	F Finance D Data Handling P probability	1 KN 2 RP 3 MSP 4 R&R
4.1.1	Median = 163 cm or 1,63 m	2	163	D	2
4.1.2	$IQR = 172 - 159$ $IQR = 13$	2	subtract correct values 13	D	2
4.1.3	Number of learners = $32 \times 25\% = 8$ Alternative answer Number of learners = $32 \times 75\% = 24$ Number of learners = $32 - 24 = 8$	2	multiply by 25% 8 learners	D	2
4.2.1	Between the 50 th and 75 th percentile	2	50 th percentile 75 th percentile	D	2
4.2.2	Approximately 30 th percentile (26 th – 34 th mark correct)	2	30 th percentile	D	3
4.2.3	15 years old	2	15 years old	D	3
4.2.4	She is taller than 80% of all girls her age. Or Only 20% of girls are taller than her.	2	taller 80% of all girls her age	D	4
4.3.1	R700	2	R700	F	2
4.3.2	R600	2	R600	F	2
4.3.3	(a) Cost = $600 + 3(101 - 100) = R603$ (b) $750 = 600 + 3(n - 100)$ $n = 150$ Answer only $n = 150$ NO MARKS $b = 750 - 600 = 150$	1 2	R603 correct substitution 150	F F	2 3

Q4	Marking guideline	Skills assessed	Topic	Level
KEY	a accuracy m method mca method continued accuracy	ca continued accuracy ma method accuracy r rounding	F Finance D Data Handling P probability	1 KN 2 RP 3 MSP 4 R&R
4.3.4	(a) (i) R0 (ii) R500 (iii) 120 (b) $C = 5n$	R0 R500 120 Cost (c) $5n$	F F F F	2 2 2 3
4.3.5	Chart Title: Cost of three different internet options per month 	Labels Heading Both axes labels B and C graphs labelled or key/legend option B y-intercept R600 horizontal line until 100GB correct end point (200GB; R900) option C y-intercept R0 correct plotting from table correct end point (200GB; R1000)	F	3

Q4	Marking guideline	Skills assessed	Topic	Level
KEY	a accuracy m method mca method continued accuracy	ca continued accuracy ma method accuracy r rounding	F Finance D Data Handling P probability	1 KN 2 RP 3 MSP 4 R&R
4.3.6	(a) Letter Z on graph at R750 on y-axis Letter Z at intersection 1 mark only (b) 150 GB	on the y-axis at R750 150 GB	F F	3 3
4.3.7	If you use less than 140 GB of data per month you will pay less than R700 which is less than both options A and B	less than 140 GB	F	4
	MARKS			

Q5	Marking guideline	Skills assessed	Topic	Level
KEY	a accuracy m method mca method continued accuracy	ca continued accuracy ma method accuracy r rounding	F Finance D Data Handling P probability	1 KN 2 RP 3 MSP 4 R&R
5.1.1	$2020 - 1975 + 1 = 45 + 1 = 46$ years Answer Only Full marks	subtract years 45 46	F	2
5.1.2	(a) $\frac{R1\ 400\ 000}{\frac{1}{3}} = R4\ 200\ 000$ Alternative Answer $R1\ 400\ 000 \times 3 = R4\ 200\ 000$ (b) $R4\ 200\ 000 - R1\ 400\ 000 = R2\ 800\ 000$ Alternative Answer $\frac{2}{3} \times R4\ 200\ 000 = R2\ 800\ 000$ Alternative Answer $2 \times R1\ 400\ 000 = R2\ 800\ 000$	R1 400 000 dividing by $\frac{1}{3}$ R4 200 000 Alternative Answer R1 400 000 multiplied by 3 R4 200 000 subtract R1 400 000 R2 800 000 Alternative Answer $\frac{2}{3} \times R1\ 400\ 000$ R2 800 000 Alternative Answer $2 \times R1\ 400\ 000$ R2 800 000	F F	3 2
5.1.3	Tax = $R130\ 500 + 35\% \times (R1\ 400\ 000 - R1\ 050\ 000)$ Tax = $R130\ 500 + 35\% \times (R350\ 000)$ Tax = $R130\ 500 + R122\ 500$ Tax = R253 000 Lump sum after tax = $R1\ 400\ 000 - R253\ 000 = R1\ 147\ 000$ He was correct	correct tax bracket R350 000 or $R1\ 400\ 000 - R1\ 050\ 000$ R253 000 $R1\ 400\ 000 - R253\ 000$ R1 147 000 He was correct	F	4

Q5	Marking guideline	Skills assessed	Topic	Level
KEY	a accuracy m method mca method continued accuracy	ca continued accuracy ma method accuracy r rounding	F Finance D Data Handling P probability	1 KN 2 RP 3 MSP 4 R&R
5.1.4	He should take a lump sum amount of R500 000 or less as this has a 0% tax rate, resulting in no tax being paid.	R500 000 (R1 – R500 000) or less than R500 000 0% tax rate	F	4
5.1.5	$R1\ 147\ 000 \times 15\% = R172\ 050$ Year 1 = $R172\ 050 \times 104,4\% = R179\ 620,20$ Year 2 = $R179\ 620,20 \times 104,4\% = R187\ 523,49$ Alternative answers Interest = $R172\ 050 \times 4,4\% = R7570,20$ Year 1 = $R172\ 050 + R7570,20 = R179\ 620,20$ Interest = $R179\ 620,20 \times 4,4\% = R7903,29$ Year 2 = $R179\ 620,20 + R7903,29 = R187\ 523,49$ $A = R172\ 050 (1+4,4\%)^2 = R187\ 523,49$ Wrong formula No marks	multiply by 15% R172 050 104,4% R179 620,20 104,4% R187 523,49	F	3
5.1.6	Over time the inflation rate will reduce the purchasing power of the investment, because prices typically increase over time. However due to the inflation rate being lower than the interest rate the investment will still experience some growth.	purchasing power prices increase some growth	F	4
5.2.1	$100\% - 79\% = 21\%$	subtract 79% 21%	P	2
5.2.2	$\frac{4}{5} = 0,8$	4 5 0,8	P	2

Total: 150 marks