



higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

MATHEMATICAL LITERACY

(First paper)
NQF LEVEL 4

16 November 2020

Symbol	Explanation
M	Method
MA	Method with accuracy
CA	Consistent accuracy
A	Accuracy
C	Conversion
S	Simplification
RT/RG/RD	Reading from a table/Reading from a graph/drawing
F	Choosing correct formula
SF	Substitution in formula
R/J	Reasoning / Justification
P	Penalty, e.g. for no units, incorrect rounding off, etc.
R	Rounding off
MF	Manipulating formula
E	Explanation

This marking guideline consists of 10 pages.

QUESTION 1 [30] *Do not deduct marks if the R or the % sign is omitted.		
Question	Solution	Explanation
1.1	$60 - (\sqrt{16} + 2 \times 4) \div 3$ $= 60 - (4 + 8) \checkmark \div 3$ $= 60 - 12 \checkmark \div 3$ $= 60 - 4 \checkmark$ $= 56 \checkmark$	BODMAS 1 A bracket (4 + 8) 1 A -12 1 A -4 1A (4)
1.2	$\frac{12}{14}; \frac{3}{7}; \frac{2}{3}$ $= \frac{36}{42}; \frac{18}{42}; \frac{28}{42} \checkmark$ $\text{Ascending order: } \frac{18}{42}; \frac{28}{42}; \frac{36}{42}$ $\therefore \frac{3}{7} \checkmark; \frac{2}{3} \checkmark; \frac{12}{14} \checkmark$	1 M LCD 3A - correct ascending order (4)
1.3	$0,375 \times 1\,000 \checkmark$ $= 375 \checkmark \text{ grams}$ $375 \times 1\,000 \checkmark$ $= 375\,000 \checkmark \text{ milligrams}$ <p style="text-align: center;">OR</p> $0,375 \times 1\,000\,000 \checkmark \checkmark \checkmark$ $= 375\,000 \checkmark \text{ milligrams}$	1 M $\times 1\,000$ 1 C 375 1 M $\times 1\,000$ 1 C 375 000 2A $\times 1\,000\,000$ 1 M $0,375 \times 1\,000\,000$ 1 C 0375 000 (4)
1.4	$140\% = \frac{140}{100}$ $= \frac{7}{5} \checkmark$ $= 1\frac{2}{5} \checkmark$	1 MA 1 MA (2)

1.5	<p>Thursday 15:37 to Monday 03:37 = 3 days 12 hours ✓ Monday 03:37 to Monday 10:42 = 7 hours and 5 min ✓</p> <p>Total time passed = 3 days 19 hours 5 min ✓</p> <p style="text-align: center;">OR</p> <p>Thursday 15:37 to Sunday 15:37 = 3 days ✓</p> <p>Sunday 15:37 to Monday 10:42:</p> $\begin{array}{r} 34:42 \\ -15:37 \\ \hline 19:05 \end{array} \checkmark$ <p>Total time passed = 3 days 19 hours 5 min ✓</p>	<p>1 M 1 M 1 A 1 M 1 M 1 A</p> <p style="text-align: right;">(3)</p>
1.6	<p>Volume of sphere = $\frac{4}{3}\pi r^3$</p> $= \frac{4}{3} \times 3,14 \times (5,7)^3$ $= 775,34 \text{ cm}^3$	<p>2 SF 1 A</p> <p style="text-align: right;">(3)</p>
1.7	$\text{¥} = \frac{9755}{0,13} \quad \checkmark \quad \checkmark$ $\therefore = 5038,46 \quad \checkmark$	<p>2 MA 1 A</p> <p style="text-align: right;">(3)</p>
1.8	<p>Speed = $\frac{\text{distance}}{\text{time}} \quad \checkmark$</p> $= \frac{5}{0,21028} \quad \checkmark$ $= 23,78 \text{ km/h} \quad \checkmark$	<p>1 MF 1C + 1C 1A</p> <p style="text-align: right;">(4)</p>

1.9	<p><u>$4 \times 100\text{g}$ for R22,99:</u></p> $\text{Cost per gram} = \frac{R22,99}{400\text{g}} = R0,0575 / \text{g} \quad \checkmark$ <p><u>$3 \times 175\text{g}$ for R26,99:</u></p> $\text{Cost per gram} = \frac{R26,99}{525\text{g}} = R0,0514 / \text{g} \quad \checkmark$ <p>Therefore the $3 \times 175\text{g}$ for R26,99 is more cost effective \checkmark</p>	<p>1 A</p> <p>1 A</p> <p>1 A</p>	(3)
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QUESTION 2 [30] *Penalise once for incorrect unit unless stated			
Question	Solution	Explanation	
2.1	<p>Area = $h \times w$</p> <p>$2,25\checkmark = 2,5\checkmark \times w$</p> <p>$w = \frac{2,25}{2,5}\checkmark$</p> <p>$w = 0,9\text{m}\checkmark$</p>	<p>2 SF</p> <p>1 MF</p> <p>1 A</p>	(4)
2.2	<p>Area wall without windows and doors = $h \times w$</p> <p style="text-align: right;">$= 20 \times 4\checkmark$</p> <p style="text-align: right;">$= 80\checkmark \text{m}^2$</p> <p>Area door = $2,25 \text{m}^2$</p> <p>Area windows = $3 \times h \times w$</p> <p style="text-align: right;">$= 3 \times 1,2 \times 0,5\checkmark$</p> <p style="text-align: right;">$= 1,8\checkmark \text{m}^2$</p> <p>Therefore, area of front wall = $80 - 2,25 - 1,8\checkmark$</p> <p style="text-align: right;">$= 75,95 \text{m}^2 \checkmark$</p>	<p>1 SF</p> <p>1 A</p> <p>1 MA</p> <p>1 A</p> <p>1 M</p> <p>1 A with unit</p>	(6)
2.3	<p>Total area = width \times (height of front wall + height of back wall)</p> <p style="text-align: right;">$= 8 \times (4 + 3,2)\checkmark$</p> <p style="text-align: right;">$= 57,6\checkmark \text{m}^2$</p> <p>Area for 2 walls = $2 \times 57,6\checkmark$</p> <p style="text-align: right;">$= 115,2\checkmark \text{m}^2$</p>	<p>1 SF (all must be correct)</p> <p>1 A</p> <p>1M</p> <p>1 A</p>	(4)

2.4	$\text{Circumference} = 2 \times \pi \times r$ $4,7728\checkmark = 2 \times 3,14 \times r$ $r = \frac{4,7728\checkmark}{2 \times 3,14\checkmark}$ $= 0,76\text{m}\checkmark$ $= 76\text{cm}\checkmark$	1 SF 2 MF 1 A 1 C (5)
2.5	$\text{Area} = \pi \times r^2$ $= 3,14 \times (0,76)^2\checkmark$ $= 1,813\text{.....}\checkmark$ $\therefore \text{Total area} = 1,813 \times 2$ $= 3,63\checkmark\text{m}^2$	1 SF (CA Q2.4) 1 CA 1 CA (3)
2.6	$\text{Number of litres, one coat} = \frac{251,52\checkmark}{8\checkmark}$ $= 31,44\checkmark\ell$ $\text{Number of litres, two coats} = 2 \times 31,44 = 62,88\checkmark\ell$ $= 63\checkmark\ell$	2 M 1 A 1 MA 1 R (5)
2.7	Total cost of paint: $2 \times \text{R}749 = \text{R}1\,498\checkmark$ $2 \times \text{R}279 = \text{R}558\checkmark$ $\text{Total cost} = \text{R}1\,498 + \text{R}558 = \text{R}2\,056\checkmark$	1 MA 1 MA 1 A (3)

QUESTION 3 [30] * (DO NOT PENALISE IF THE R IS OMITTED)			
Question	Solution		Explanation
3.1	3.1.1	D✓	1 A (1)
	3.1.2	F✓	1 A (1)
	3.1.3	A✓	1 A (1)
	3.1.4	B✓	1 A (1)
	3.1.5	C✓	1 A (1)

3.2	3.2.1	On 10/06/2019✓ at 14:36✓ Accept: 10 June 2019	2 A (2)
	3.2.2	With a # ✓ Accept the word hashtag	1 A (1)
	3.2.3	Zero rated items are exempt from VAT✓ Also accept VAT exclusive	1 A (1)
	3.2.4	She paid by card ✓ Accept: Electronic payment	1 A (1)
	3.2.5	Weight of lean mince = $\frac{52,73}{115,75}$ ✓ = 0,455...✓ = 0,5 ✓kg	2 MA 1 A 1 R (4)
	3.2.6	VAT inclusive items: Sandwich white bread R14,99 24 litres recyclable R0,62 Sticky ribs R170,23✓ Lean beef mince R52,73 24 litres recyclable R0,62 Total R239,19 ✓ Taxable value = $\frac{239,19 \times 100}{115}$ ✓ = 207,99	1 M – adding VAT inclusive items 1 A 3 MA (5)
3.3	3.3.1	A monthly deduction from an account holder's bank account by a third party but with the consent of the account holder (Accept other correct responses)	1 E (1)
	3.3.2	Difference = R170 887,43 - R116 713,39 ✓ = R54 174,04✓	1 M 1 A (2)

	3.3.3	<p>1 May 2019 to 1 May 2031 = 12 years✓ Number of months = 12 years × 12 months = 144 months✓</p> <p>1 May 2031 to 1 November 2031 = 6 months ✓</p> <p>Total number of months = 144 + 6 ✓= 150</p>	<p>1 MA – 12 years</p> <p>1 MA – 144 months</p> <p>1 MA – 6 months</p> <p>1 M – 144 +6</p> <p>(4)</p>
	3.3.4	<p>Total contribution = R483,29 × 150✓ = R72 493,50✓</p>	<p>1 M</p> <p>1 A</p> <p>(2)</p>
	3.3.5	<p>New monthly contribution = R483,29 × 107,9%✓ = R521,47✓</p>	<p>1 M</p> <p>1 A</p> <p>(2)</p>

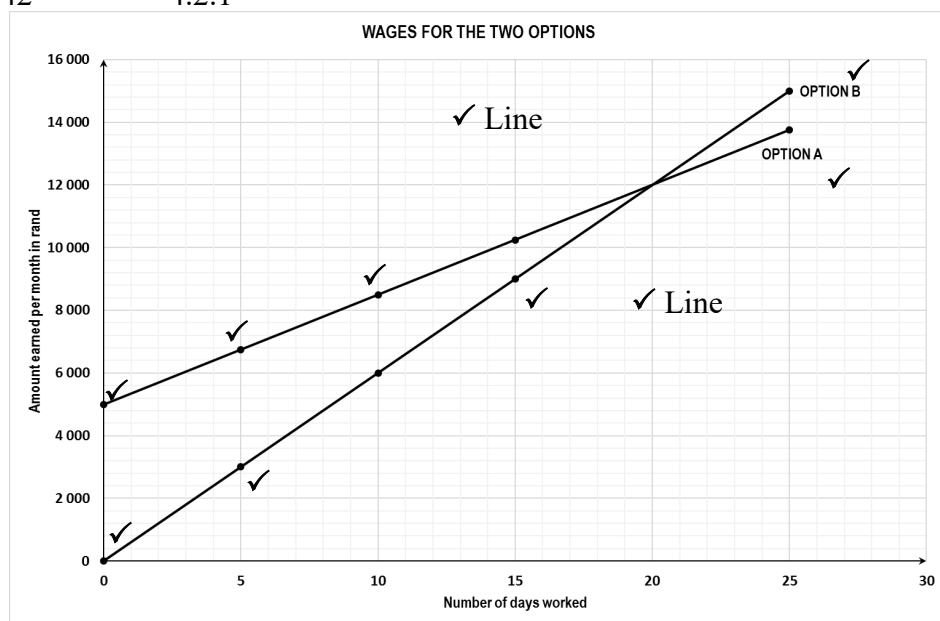
QUESTION 4 [30] * (DO NOT PENALISE IF THE R IS OMITTED)

Question	Solution	Explanation
4.1	4.1.1 Graph A - Bakkie✓ Graph B - SUV ✓	2 RG (2)
	4.1.2 R 1 500 ✓ ✓	2 RG (2)
	4.1.3 R600✓ ✓	2 RG (2)
	4.1.4 Total travel cost✓ = $\frac{3\,000\checkmark}{\text{Number of students}\checkmark}$ Or Number of students✓ × total travel cost✓ = 3 000✓ Or $y\checkmark = \frac{3\,000\checkmark}{x\checkmark}$ Or $x\checkmark \times y\checkmark = 3\,000\checkmark$	3 A (3)

	4.1.5	Total travel cost✓ = R1 500✓ Or $y✓ = 1\,500✓$	2 A (2)
	4.1.6	(2✓; 1 500✓)	2 A (2)
	4.1.7	Indirect relationship✓ The number of students and the total travel cost has a constant product ✓ Or As the number of students increases by a factor of 3 000, the total travel cost decreases by the same factor ✓	1 A 1 E (2)
	4.1.8	Constant relationship ✓ As the number of students increases, the total travel cost stays the same ✓	1 A 1 A (2)

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4.2.1



2 Labelling each graph✓✓

4 Option A graph – (3 for plotting and 1 for line) ✓✓✓✓

4 Option B graph – (3 for plotting and 1 for line) ✓✓✓✓

(10)

	4.2.2	After 20 days✓✓	1 RG (1)
	4.2.3	The graph does not start at (0; 0) ✓ The variables do not have a constant ratio✓	1 E 1 E (2)

QUESTION 5 [30] * (DO NOT PENALISE IF THE % SIGN IS OMITTED)									
Question	Solution	Explanation							
5.1.	A = 32 062✓✓ B =702 383✓✓	2 MA 2 MA (4)							
5.2	2016 ✓✓	2 RT (2)							
5.3	There was a general increase in enrolments✓✓ Accept any other appropriate answer	2 E/RT (2)							
5.4	Enrolment fluctuated✓✓ Or Enrolment was erratic✓✓ Accept any other appropriate answer	2 E/RT (2)							
5.5	Range = 62 359 – 13 642 ✓ = 48 717✓ (Answer only full marks)	1 M 1 A (2)							
5.6	<table border="1"><tr><td>13 642 ✓</td></tr><tr><td>19 000</td></tr><tr><td>19 825</td></tr><tr><td>20 533 Median ✓</td></tr><tr><td>20 799</td></tr><tr><td>23 160</td></tr><tr><td>62 359</td></tr></table> Median = 20 533✓	13 642 ✓	19 000	19 825	20 533 Median ✓	20 799	23 160	62 359	1 A Ascending order 1 MA position of median 1 A (3)
13 642 ✓									
19 000									
19 825									
20 533 Median ✓									
20 799									
23 160									
62 359									

5.7	$\text{Mean} = \frac{179\,318\checkmark}{7\checkmark}$ $= 25\,616,86\checkmark$ $= 25\,616\checkmark$		1 A 179 318 1 M $\div 7$ 1 A 1 R rounding down (4)
5.8	$\text{Percentage decrease} = \frac{705\,397 - 737\,880\checkmark}{737\,880\checkmark} \times 100\checkmark$ $= -4,40\%\checkmark$ <p>Therefore, percentage decrease is 4,4%\checkmark</p> <p>(Accept other alternatives)</p>		3 MA 1 A 1 A (5)
5.9	5.9.1	CBMT enrolments: 2010-2016\checkmark (Accept appropriate alternatives)	1E (1)
	5.9.2	Although the number of years is continuous\checkmark, the number of students enrolled is discrete\checkmark. Broken line graphs represent discrete data. (Accept appropriate alternatives)	2R/J (2)
	5.9.3	2012\checkmark Outlier\checkmark	1 RG 1 R/J (2)
	5.9.4	The vertical/dependant/y axis does not start at zero. \checkmark	1 R/J (1)

TOTAL: 150