



higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

MATHEMATICAL LITERACY

(First paper)

NQF LEVEL 4

21 February 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/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

This marking guideline consists of 8 pages.

QUESTION 1 *Do not deduct marks if the R or % signs are omitted.		
Question	Solution	Explanation
1.1	$\frac{\sqrt{36} - \sqrt[3]{125} + 12^2}{1 + 4(48 - 12)}$ $= \frac{6 - 5 + 144 \checkmark}{1 + 144 \checkmark}$ $= \frac{145 \checkmark}{145 \checkmark}$ $= 1 \checkmark$	1 numerator 1 denominator 1 S 1A (1 answer only) (4)
1.2	$\frac{1}{5}; \frac{3}{4}; \frac{3}{10}$ $= \frac{4}{20}; \frac{15}{20}; \frac{6}{20} \checkmark \text{ Or } 0,2; 0,75; 0,3 \text{ or } 20\%; 75\%; 30\%$ $= \frac{3}{4} \checkmark; \frac{3}{10} \checkmark; \frac{1}{5} \checkmark$	1 M LCD 3A – correct descending order (4)
1.3	$\frac{175\,000}{1000} \checkmark = 175 \text{ mg} \checkmark$ $\therefore \frac{175}{1000} \checkmark = 0,175 \text{ kg} \checkmark$ <p>OR</p> $\frac{175\,000}{1\,000\,000} \checkmark \checkmark \checkmark$ $= 0,175 \text{ kg} \checkmark$	1 M $\div 1\,000$ 1 C 175 1 M $\div 1\,000$ 1 C 0,175 2A $\div 1\,000\,000$ 1 M $\frac{175\,000}{1\,000\,000}$ 1 C 0,175 (4)
1.4	$0,732 = \frac{732}{1000} \checkmark$ $= \frac{183}{250} \checkmark$	1 M 1 A (1 answer only) (2)
1.5	Wednesday 20:43 to Friday 08:43 = 36 hours \checkmark Friday 08:43 to Friday 13:57 = 5 hours 14 min \checkmark 36 hours 0 minutes + 5 hours 14 minutes = 41 hours 14 min \checkmark Accept any other relevant calculation	1 MA 1 MA 1 A (3)

1.6	$\text{Percentage increase} = \frac{\text{R}39850 - \text{R}34657 \checkmark}{\text{R}34657 \checkmark} \times 100 \checkmark$ $= 14,98\% \checkmark$	3 MA 1 A (4)
1.7	$\text{R}2\,500 = 2\,500 \times 0,073 \checkmark$ $= \text{€}182,50 \checkmark$ $= \text{€}183 \checkmark$	1 M 1 A 1 R (3 answer only) (3)
1.8	$\text{Distance} = \text{speed} \times \text{time}$ $\therefore \text{time} = \frac{\text{distance}}{\text{speed}} \checkmark$ $= \frac{187}{104} \checkmark$ $= 1,798 \checkmark$ $= 1,8 \text{ hours} \checkmark$	1 MF 1 SF 1 A 1 R (4)
1.9	$\frac{120}{100} \checkmark$ $= 1,2 \text{ cm}^2 \checkmark$	1MA 1A (2)
		[30]

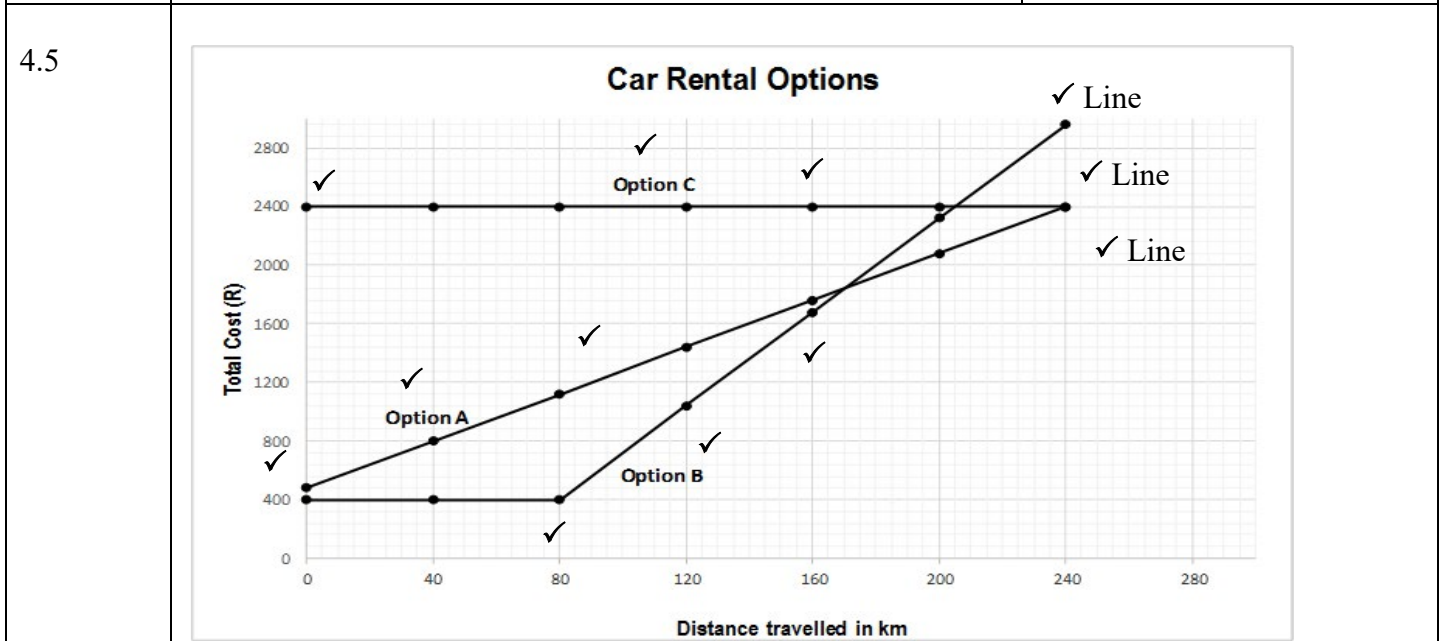
QUESTION 2 *Penalise once for incorrect unit unless stated otherwise.			
Question		Solution	Explanation
2.1	2.1.1	SE✓✓	2 RM (2)
	2.1.2	5 medical points✓✓	2 RM (2)
	2.1.3	7 km✓ and 26 km✓	2 RM (2)
	2.1.4	4 ✓✓	2 RM (2)
	2.1.5	Approximate distance $\approx 32 \text{ km}\checkmark - 15 \text{ km}\checkmark$ $\approx 17 \text{ km}\checkmark$	1 RM and 1 M 1 A (3)
	2.1.6	1:500 000 32,4 mm:actual distance in mm \therefore Actual distance in mm = $32,4\checkmark \times 500\ 000\checkmark$ $= 16\ 200\ 000 \text{ mm}\checkmark$ Actual distance in km = $16\ 200\ 000 \text{ mm} \div$ $1\ 000\ 000\checkmark$ $= 16,2 \text{ km}\checkmark$	2 M 1 A 1 C 1 CA (5)
2.2	2.2.1	Number of layers = $\frac{350}{110}\checkmark = 3,18\checkmark = 3 \text{ layers}\checkmark$	1 M dividing 1 A 1 R rounding down (3)
	2.2.2	Number of cans lengthwise = $\frac{480}{75} = 6,4\checkmark = 6\checkmark$ Number of cans width-wise = $\frac{310}{75} = 4,13 = 4\checkmark$ \therefore Maximum number of cans = $6 \times 4 \times 3\checkmark = 72\checkmark$	1 M dividing 1 A 1 A 1 M $6 \times 4 \times 3$ 1 CA (Q2.2.1) (5)
	2.2.3	Surface area = $2\pi rh + 2\pi r^2$ $= 2(3,14)(37,5)(110)\checkmark + 2(3,14)(37,5)^2\checkmark$ $= 34\ 736,25 \text{ mm}^2\checkmark$	1 SF + 1SF 1 A (3)
	2.2.4	Volume = length \times width \times height $= 480 \times 310 \times 350\checkmark$ $= 52\ 080\ 000\checkmark \text{ mm}^3\checkmark$	1 SF 1 A 1 unit (3)
			[30]

QUESTION 3 *Do not penalise if R sign is omitted.			
Question		Solution	Explanation
3.1	3.1.1	C✓	1 A
	3.1.2	D✓	1 A
	3.1.3	E✓	1 A
	3.1.4	F✓	1 A
	3.1.5	A✓	1 A
			(5 × 1) (5)
3.2	3.2.1	Number of years = $72 \div 12$ ✓ = 6✓	1 M/RT 1 A (answer only full marks) (2)
	3.2.2	Rand amount = $72 \times R6\,721$ ✓ = R483 912✓	1 M 1 A (answer only full marks) (2)
	3.2.3	Final balloon payment = $R444\,500$ ✓ × 29%✓ = R128 905✓	1 RT and 1 M 1 A (answer only full marks) (3)
	3.2.4	Service delivery fee = $R617\,149$ ✓ – $R483\,912$ ✓ – $R128\,905$ ✓ = R4 332✓	3 M 1 CA (Q3.2.2/Q3.2.3) (4)
	3.2.5	1 st year = $94,5\%$ ✓ × $R444\,500$ ✓ = R420 052,50✓ 2 nd year = $94,5\%$ × $R420\,052,50$ ✓ = R396 949,61✓ OR 1 st year = $R444\,500 - 5,5\% \times R444\,500$ = $R444\,500 - R24\,447,50$ ✓ = R420 052,50✓ 2 nd year = $R420\,052,50 - 5,5\% \times R420\,052,50$ ✓ = $R420\,052,50 - 23\,102,89$ ✓ = R396 949,61✓	2 M 1 A 1 M × R420 052,50 1 CA 1 MA 1 MA 1 A 1 M × R420 052,50 1 CA (5)

3.3	3.3.1	Consumption charge $= (6 \times 0) + (9 \times R8,18) + (10 \times R9,93) + (49 \times R11,80)$ $= R751,12$	4 MA/RT 1 A	(5)
	3.3.2	VAT = $R751,12 \times 15\%$ $= R112,67$	1 M 1 CA (Q3.3.1)	(2)
	3.3.3	Total amount due = $R751,12 + R112,67$ $= R863,79$	1 M 1A	(2)
				[30]

QUESTION 4 *Do not penalise if R sign is omitted.

Question	Solution	Explanation
4.1	Option B ✓✓	2 RT (2)
4.2	240 km ✓✓	2 RT (2)
4.3	Total cost = $R400 + 16(160 - 80)$ $= 400 + 1280$ $= R1\ 120$	3 MA 1 A (4)
4.4	Option A: Total cost in (R) = $R160 \times \text{number of days} + R8 \times \text{kilometres travelled}$	1AR 180 1 A \times number of days 1 A $+ R8$ 1 A \times kilometres travelled (4)



Labelling each graph ✓✓✓
 Option A graph – (2 for plotting and 1 for line) ✓✓✓
 Option B graph – (2 for plotting and 1 for line) ✓✓✓
 Option C graph – (2 for plotting and 1 for line) ✓✓✓ (12)

4.6	4.6.1	170 km✓✓	2 RG (2)
	4.6.2	Option B✓ Option A = R1 440✓ Option B = R1 040✓ Option C = R2 400✓	1 A 1 RG 1 RG 1 RG (4)
			[30]

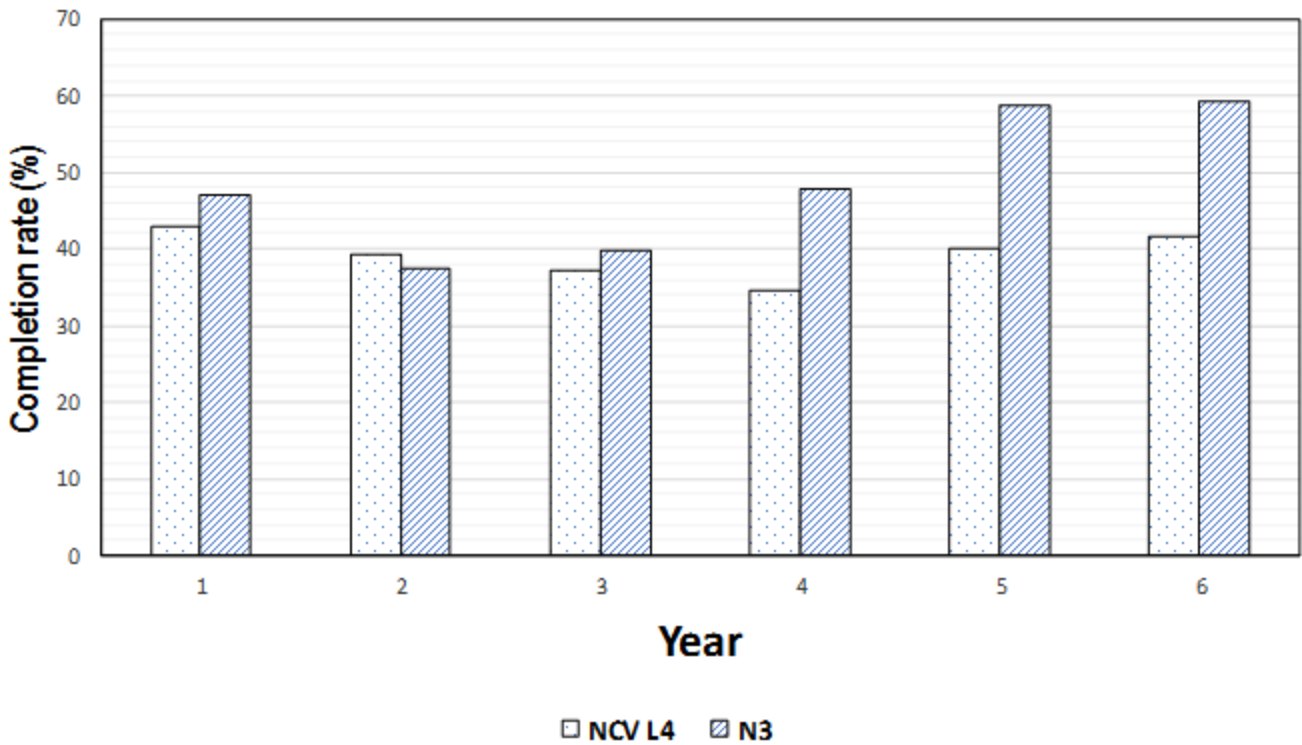
QUESTION 5 *Do not penalise if % sign is omitted.								
Question	Solution	Explanation						
5.1	$A = \frac{6\ 018}{15\ 334} \times 100 \checkmark = 39,2\% \checkmark$ $B = 9\ 928 \times \frac{37,5}{100} \checkmark = 3\ 723 \checkmark$	1 M 1 A (answer only full marks) 1 M 1 A (answer only full marks) (4)						
5.2	2014✓✓	2 RT (2)						
5.3	NC (V) L4 completion rates were stable/consistent with previous years.✓✓	2 E/RT (any relevant answer) (2)						
5.4	Report 191 N3 completion rates showed a significant increase.✓✓	2 E/RT (any relevant answer) (2)						
5.5	$\text{Range} = 11\ 898 \checkmark - 6\ 018 \checkmark$ $= 5\ 880 \checkmark$	1 M and 1 RT 1 A (answer only full marks) (3)						
5.6	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td>6 018✓</td></tr> <tr><td>7 638</td></tr> <tr><td>7 838</td></tr> <tr><td>8 346</td></tr> <tr><td>10 465</td></tr> <tr><td>11 898</td></tr> </table> $\text{Median} = \frac{7\ 838 + 8\ 346}{2} \checkmark = 8\ 092 \checkmark$	6 018✓	7 638	7 838	8 346	10 465	11 898	1 A Ascending order 1 M 1 A (3)
6 018✓								
7 638								
7 838								
8 346								
10 465								
11 898								

5.7	<p>Average completion rate N3 = $\frac{290,3}{6} \checkmark = 48,38\% \checkmark$</p> <p>Average completion rate NCV L4 = $\frac{235,1}{6} \checkmark = 39,18\% \checkmark$</p> <p>Average difference = $48,38 - 39,18 \checkmark$ $= 9,2\% \checkmark$</p>	<p>2 M 1 A 1 CA (Q5.1) 1 M 1 CA</p>
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(6)

5.8

Completion Rate: NCV L4 vs N3



Each correct double bar ✓✓✓✓✓✓
 Correct legend ✓✓

(8)

[30]

TOTAL: 150