



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	$\frac{\sqrt{36} - \sqrt[3]{125} + 12^2}{1 + 4(48 - 12)}$ $= \frac{6 - 5 + 144}{1 + 144}$ $= \frac{145}{145}$ $= 1$	1 numerator 1 denominator 1 S 1A (1 answer only) (4)
1.2	$\frac{1}{5}; \frac{3}{4}; \frac{3}{10}$ $= \frac{4}{20}; \frac{15}{20}; \frac{6}{20}$ $= \frac{3}{4}; \frac{3}{10}; \frac{1}{5}$ Or 0,2 ; 0,75 ; 0,3 or 20% ; 75% ; 30%	1 M LCD 3A – correct descending order (4)
1.3	$\frac{175\,000}{1000} = 175 \text{ mg}$ $\therefore \frac{175}{1000} = 0,175 \text{ kg}$ <p>OR</p> $\frac{175\,000}{1\,000\,000}$ $= 0,175 \text{ kg}$	1 M ÷ 1 000 1 C 175 1 M ÷ 1 000 1 C 0,175 2A ÷ 1 000 000 1 M $\frac{175\,000}{1\,000\,000}$ 1 C 0,175 (4)
1.4	$0,732 = \frac{732}{1000}$ $= \frac{183}{250}$	1 M 1 A (1 answer only) (2)
1.5	Wednesday 20:43 to Friday 08:43 = 36 hours Friday 08:43 to Friday 13:57 = 5 hours 14 min 36 hours 0 minutes + 5 hours 14 minutes = 41 hours 14 min Accept any other relevant calculation	1 MA 1 MA 1 A (3)

1.6	$\text{Percentage increase} = \frac{\text{R}39850 - \text{R}34657}{\text{R}34657} \times 100$ $= 14,98\%$	3 MA 1 A (4)
1.7	$\text{R}2\,500 = 2\,500 \times 0,073$ $= \text{€}182,50$ $= \text{€}183$	1 M 1 A 1 R (3 answer only) (3)
1.8	$\text{Distance} = \text{speed} \times \text{time}$ $\therefore \text{time} = \frac{\text{distance}}{\text{speed}}$ $= \frac{187}{104}$ $= 1,798$ $= 1,8 \text{ hours}$	1 MF 1 SF 1 A 1 R (4)
1.9	$\frac{120}{100}$ $= 1,2 \text{ cm}^2$	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 $\approx 32 \text{ km}✓ - 15 \text{ km}✓$ $\approx 17 \text{ km}✓$	1 RM and 1 M 1 A (3)
	2.1.6	1:500 000 32,4 mm:actual distance in mm $\therefore \text{Actual distance in mm} = 32,4✓ \times 500\,000✓$ $= 16\,200\,000 \text{ mm}✓$ $\text{Actual distance in km} = 16\,200\,000 \text{ mm} \div$ $1\,000\,000✓$ $= 16,2 \text{ km}✓$	2 M 1 A 1 C 1 CA (5)
2.2	2.2.1	Number of layers = $\frac{350}{110}✓ = 3,18✓ = 3 \text{ layers}✓$	1 M dividing 1 A 1 R rounding down (3)
	2.2.2	Number of cans lengthwise = $\frac{480}{75} = 6,4✓ = 6✓$ Number of cans width-wise = $\frac{310}{75} = 4,13 = 4✓$ $\therefore \text{Maximum number of cans} = 6 \times 4 \times 3✓ = 72✓$	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 = $2\pi rh + 2\pi r^2$ $= 2(3,14)(37,5)(110)✓ + 2(3,14)(37,5)^2✓$ $= 34\,736,25 \text{ mm}^2✓$	1 SF + 1SF 1 A (3)
	2.2.4	Volume = length \times width \times height $= 480 \times 310 \times 350✓$ $= 52\,080\,000✓ \text{ mm}^3✓$	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 = $R420\,052,50 - 5,5\% \times R420\,052,50$ ✓ = $R420\,052,50 - R23\,102,89$ ✓ = 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]

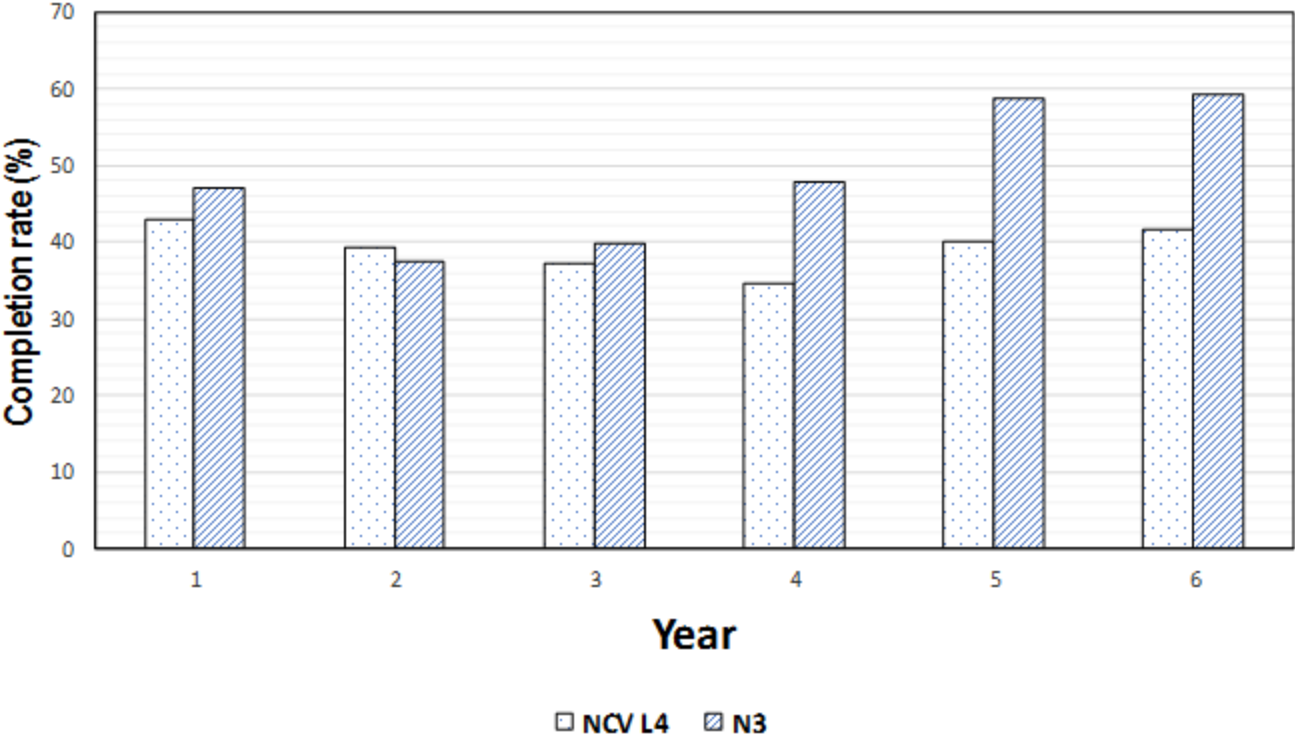
QUESTION 4 *Do not penalise if R sign is omitted.

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✓ × number of days✓ + R8✓ × kilometres travelled✓	1AR 180 1 A × number of days 1 A + R8 1 A × kilometres travelled (4)
4.5	<div><p style="text-align: center;">Car Rental Options</p></div>	
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	Range = 11 898✓ – 6 018✓ = 5 880✓	1 M and 1 RT 1 A (answer only full marks) (3)						
5.6	<table border="1"><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> <div>}</div> $\text{Median} = \frac{7\,838 + 8\,346}{2} \checkmark = 8\,092 \checkmark$	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> <p style="text-align: right;">(6)</p>
5.8	<p style="text-align: center;">Completion Rate: NCV L4 vs N3</p>  <p>Each correct double bar ✓✓✓✓✓✓ Correct legend ✓✓</p> <p style="text-align: right;">(8)</p>	
	[30]	

TOTAL: 150