higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

MATHEMATICAL LITERACY
(Second Paper)
NQF LEVEL 3

24 February 2020

SYMBOL	EXPLANATION
M	Method
MA	Method with accuracy
CA	Consistent accuracy
A	Accuracy
C	Conversion
S	Simplification
RT/RG/RD/RM	Reading from a table/graph/drawing/document/map
F	Choosing correct formula
SF	Substitute into formula
R/J	Reasoning/Justification
P	Penalty – no units, incorrect rounding off
R	Rounding off
E	Explanation
U	Unit

This marking guideline consists of 7 pages.

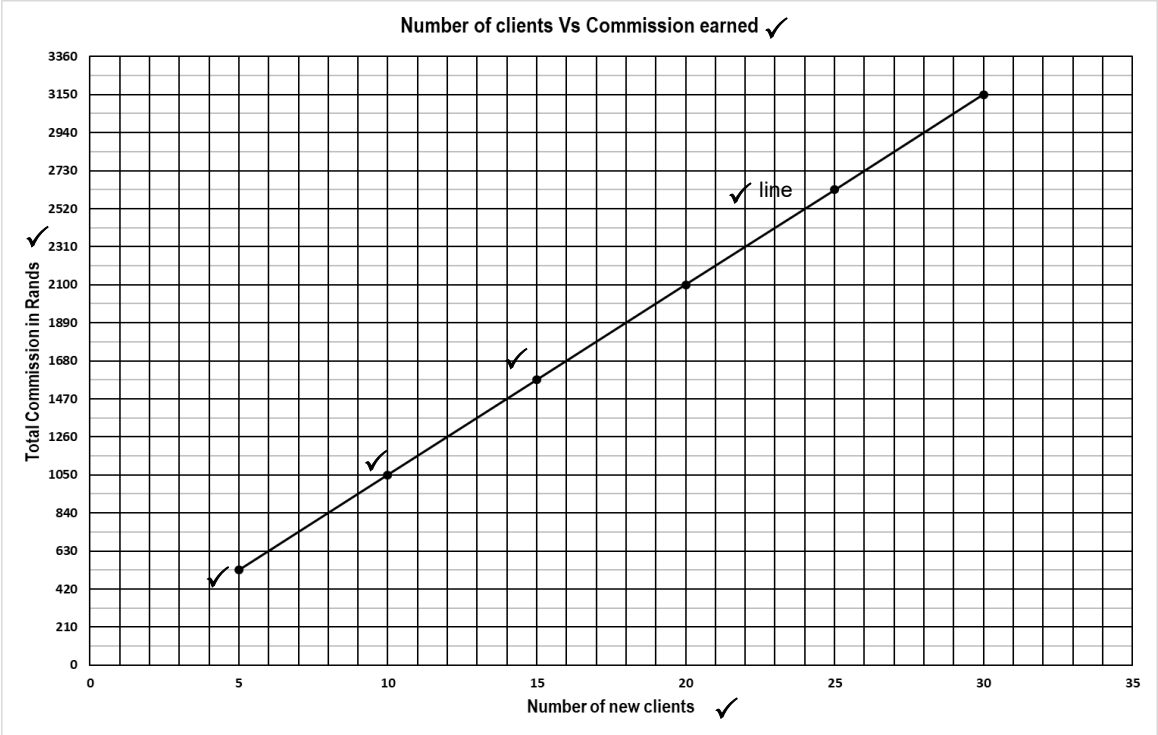
QUESTION 1 [40] *Do not deduct marks if the unit is omitted, unless stated otherwise.		
Question	**Solution**	**Explanation**
1.1 1.1.1	r = 180 ÷ 2✓ = 90 cm✓ (Answer only full marks)	1 M 1 A (2)
1.1.2	$V = \pi r^2 h$ = 3.14 ✓× 90^2✓ × 205✓ = 521 3970 ✓cm^3	3 SF 1 A (4)
1.1.3	Volume = 521 3970 ÷ 1 000✓ = 5 213, 97✓ litres ∴ Their claim is true✓	1 M 1 CA 1 R/J (3)
1.1.4	Surface area = $2\pi rh + 2\pi r^2$, where $\pi = 3,14$ SA = 2 × 3,14✓ × 90✓ ×205✓ + 2 × 3,14✓ × 90^2✓ = 166 734 ✓cm^2	5 SF 1 A (6)
1.1.5	Length = 180 + 10 = 190 cm✓ Volume = 190✓ × 190✓ × 10✓ = 361 000 ✓cm^3	1 A 190 cm 3 SF 1 A (5)
1.2	$a^2 = b^2 + c^2$ $2,33^2$ ✓= $b^2 + 1,2^2$✓ $b^2 = 2,33^2 - 1,2^2$✓ $b^2 = 3,9889$ ∴ $b = \sqrt{3,9889}$ ✓ b = 1,997✓ ∴ b = 2 ✓m	2 SF 1 M (manipulation) 1 M 1 A 1 R (6)
1.3	Volume = ½ × 2 ✓× 1,2✓ × 4✓ = 4,8 ✓m^3✓	3 SF 1 A 1 U (5)

1.4	Actual Distance in mm = 36 × 1 000 000✓ = 36 000 000✓ Map distance = 36 000 000 ÷ 500 000✓ = 72✓mm	1 M × 1 000 000 1 C 1 M ÷ 500 000 1 CA (4)
1.5	Time $= \frac{36✓}{90✓}$ $= 0,4✓$ hours ∴Time = 0,4 × 60✓ = 24✓ minutes	2 SF 1 A 1 M 1 CA (5)

QUESTION 2 [40] *Do not penalise if 'R' 0r '%' is omitted.		
Question	**Solution**	**Explanation**
2.1 2.1.1	Fixed ✓	1 A (1)
2.1.2	Rent per month 2019 = 4 500 ÷ 12✓ = 375✓	1 M 1 A (2)
2.1.3	Percentage decrease $= \frac{247\,000 - 215\,450✓}{247\,000✓} \times 100✓$ $= 12,77\%✓$	3 M 1 A (4)
2.1.4	Price increase due to cost of food increasing✓ Lack of funds✓ (any other suitable reason)	2 R/J (2)
2.1.5	A = 342 000✓ – 155 185✓ = R186 815✓ Or Add all expenses = R186 815✓ ✓ ✓	2 M 1 A (3)
2.1.6	B = R 214 430✓ – (31 500 + 4 500 + 1 900 + 93 500✓ + 64 500 + 10 200 + 1 100 +5 950) ✓ = R1 200✓	1 M R 214 430 – 1 MA adding 1 A correct answer (4)
2.1.7	**Targeted profit per year** = R12 600 ✓ × 12✓ = R151 200✓ ∴Target exceeded in 2018✓ Consider other methods	2 M 1 A 1 R/J (4)

2.1.8	Increase the price of beverages ✓ Reduce amount of travelling so fuel cost drops ✓ Decrease the price of food, so sales increase ✓ (any other relevant answer)	2R/J (2)
2.2.1	Cost of single tale-away container = R116,10 ÷ 125 ✓ = R0,9288 ✓ = 0,9288 × 100 ✓ = 92,88 = 93 cents ✓	1 M ÷ 125 1 A 1 M × 100 1 R (4)
2.2.2	A = R4 644,00 ✓ ÷ R116,10 ✓ = 40 ✓	1 RT 1 M 1 A (3)
2.2.3	B = R1 380,00 ✓ ÷ 12 ✓ = R115 ✓	1 RT 1 M 1 A (3)
2.2.4	C = R156,77 × 5 ✓ = R783,85 ✓	1 M 1 A (2)
2.2.5	D = R4 644,00 + R1 380,00 + R 783,85 ✓ = R6 807,85 ✓	1 M 1 A (2)
2.2.6	$\text{VAT} = \frac{6807,85✓ \times 15✓}{115✓}$ = R887,98 ✓	3 M 1 CA (4)

QUESTION 3 [35] *Do not penalise if 'R' is omitted.		
Question	**Solution**	**Explanation**
3.1 3.1.1	Independent variable: Number of new clients ✓	1 RT (1)
3.1.2	Direct proportion ✓ : As the number of new clients increases ✓ the total commission increases in the same proportion. ✓	1 A 2 R/J (3)
3.1.3	Commission per client = R525 ÷ 5 ✓ = R105 ✓ (Answer only full marks)	1 M 1 A (2)

3.1.4	Commission = R105✓ × number of new clients✓	2 A (2)
3.1.5	A = R2 625✓ ✓ B = 30✓ ✓	1 A 1 A (4)
3.1.6	 1 labelling title, 1 labelling horizontal axis 1 labelling vertical axis 1 straight line 3A plotting any 3 points correctly (7)	
3.1.7	Commission for 50 clients = R105 × 50 = R5 250✓ Commission for 8 clients = R210✓ × 8 = R1 680✓ ∴ Total commission = R5 250 + R1 680✓ = R6 930✓	1 M 2 M 1 M 1 A (5)
3.2.1	Option A = R105 ✓ + R0,90✓ × number of minutes✓	3 A (3)
3.2.2	Option A ✓ The graph is horizontal✓ Or The graph starts at 375✓	1 RG 1 R/J (2)

3.2.3	Option B ✓ The graph starts at 105 ✓ or The graph has a gradient ✓	1 RG 1 R/J (2)
3.2.4	Difference in cost = R375 ✓ - R195 ✓ = R180 ✓	2 RG/M 1 A (3)
3.2.5	Option A: If she makes calls for more than 300 cellphone calls per month ✓ Or She has her own cellphone and wishes to make more than 300 calls per month ✓	1R/J (1)

QUESTION 4 [35]		
Question	**Solution**	**Explanation**
4.1 4.1.1	5 ✓ ✓	2 A (2)
4.1.2	Mean weight from bakery A = $\frac{347}{7}$ ✓ = 49,57 ✓ kg Mean weight from bakery A = $\frac{364}{7}$ ✓ = 52 ✓ kg Therefore, Bakery A is defaulting ✓	1 M 1A 1 M 1A 1R/J (5)
4.1.3	Range = 55 ✓ – 48 ✓ = 7 ✓	1 M, 1RT 1A (3)
4.1.4	Ascending order: 48; 49; 49; 49; 49; 50; **50; 51**; ✓ 51; 51; 52; 53; 54; 55 ✓ Median = $\frac{50+51}{2}$ ✓ = 50,5 ✓ kg	 1 A order 1 A Position of median 1 M finding the average 1 A (4)
4.1.5	Modal value = 49 ✓ ✓ (More than one answer no marks)	1 RT 1 A (2)
4.2.1	Stacked ✓ bar ✓ graph	1 stacked 1 bar (2)

4.2.2	22 years ✓ ✓	2 RG (2)
4.2.3	Males = 3 + 2 + 4 + 5 + 1 ✓ ✓ = 15 ✓	1 RG, 1 M 1 A (3)
4.2.4	20 year old females = 11 – 3 ✓ ✓ = 8 ✓	1 RG, 1 M 1 A (3)
4.2.5	Males = 15 Females = 35 -15 = 20 ∴ ratio of male to female 15 ✓ : 20 ✓ 3 : 4 ✓	(CA Q4.2.3) 2 CA 1 S (3)
4.2.6	Probability (male) $= \frac{15\checkmark}{35\checkmark} = 42,86\%\checkmark$	1RG numerator 1A denominator 1CA percentage (3)
4.2.7	Probability (21 year old female) $= \frac{5\checkmark}{35\checkmark} = \frac{1}{7}\checkmark$	1RG numerator 1A denominator 1CA simplified fraction (3)
	TOTAL:	**150**