higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

NOVEMBER EXAMINATION

MATHEMATICAL LITERACY
(First Paper)
NQF LEVEL 3

29 OCTOBER 2013

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	Substitution in formula
R/J	Reasoning/Justification
P	Penalty, e.g. for no units, incorrect rounding off etc.
R	Rounding off
E	Explanation
U	Unit

This marking guideline consists of 11 pages.

QUESTION 1				
NOTE: Do not subtract a mark for R omitted in question 1.				
Question		**Solution**		**Explanation**
1.1	1.1.1	= 60 + 2✓ = 62✓		1 M BODMAS rule 1 A 62 (2 Answers only) (2)
	1.1.2	= 0,75 × R250,03✓ OR = $\frac{75}{100}$ × R250,03✓ = R187,52✓ = R187,52✓ (do not accept R187,5 or R188)		1 M 1 A R187,52 (2 Answers only) (2)
	1.1.3	= $\frac{1}{6}$(12) ✓✓× 10✓ = 20✓		2 M BODMAS rule 1 CA invert and multiply by 10 1 A (3 Answer only) (4)
1.2		0,441; 0,44; 0,4; 0,155✓✓ (No marks to be allocated for arranging in ascending order)		1 Mark for 2 consecutive values (2 Marks for all in correct order) (2)
1.3		104 + 34✓ =138✓		1 M 1 A (2 Answers only) (2)
1.4		**<u>Solution 1:</u>** **<u>Convert 75 000 g into kgs:</u>** = 75 000 ÷ 1 000✓ = 75 kg **<u>Convert 75 kg into tonnes</u>**: = 75 ÷ 1 000 ✓ = 0,075 ✓tonnes	**<u>Solution 2:</u>** 1 kg = 1 000 g 1 t = 1 000 kg ∴1 t = 1 000 × 1 000 = 1 000 000 grams **<u>Convert 75 000 g into tonnes:</u>** = 75 000 ÷ 1 000 000✓✓ = 0,075 ✓tonnes	**<u>Solution 1:</u>** 1 C into kg (÷ 1 000) 1 C into tonnes (÷ 1 000) 1 A 0,075 (tonnes) ***OR*** **<u>Solution 2:</u>** 2 M ÷ 1 000 000 1 A 0,075 (tonnes) (3 Answer only) (3)
1.5		1 : 4,5 minutes x : 27 minutes x = 27 minutes ✓÷ 4,5 minutes✓ x = 6 times around the track✓		2 M 1 A (3 Answers only) (3)

1.6		Ratio 1:2:5 **Number of data files on DVD** $= \frac{2}{8}$ ✓× 2700✓ = 675✓ data files on DVD OR 2700 ÷ 8 ✓= 337,50 337,50 × 2✓ = 675✓	2 M 1 A (Allocate 1 mark for multiplication by 2700 only if $\frac{1}{8} or \frac{5}{8}$ is used) (3)
1.7		**Calculate Money Left Over After Donating R26 500** = R450 000 – R26 500✓ = R423 500✓ **Calculate The Cost Of The House Renovations** $= \frac{3}{4}$ × R423 500✓ = R317 625✓ (No marks allocated for calculating $\frac{3}{4}$ × R450 000)	Money left after donation: 1 M subtraction 1 A R423 500 (2 Answer only) Cost of the renovations: 1 M multiplication 1 A R317 625 (2 Answer only) (4)
1.8	1.8.1	R520,20 ÷ 45 litres✓ = R11,56 per litre✓	1 M ÷ 45 l 1 A R11,56 per litre (2 Answers only) (2)
	1.8.2	R11,56 × 50✓ = R578✓	CA 1.8.1 1 M × 50 1 A R578 (2 Answer only) (2)
1.9		**Solution 1:** V = $l \times l \times l$ = 62 cm × 62 cm × 62 cm✓ = 238 328 cm^3✓ ***OR*** **Solution 2:** V = l^3 = $(62\ cm)^3$✓ = 238 328 cm^3✓ **Solution 3:** V=238 328 ✓cm^3✓	**Solution 1:** 1 SF 1 A with units 238 328 cm^3 ***OR*** **Solution 2:** 1 SF 1 A with units 238 328 cm^3 (2)
1.10		3,5✓✓ kg (Refer to printed version of paper for reading on scale)	2 A (2)

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QUESTION2		
Question	**Solution**	**Explanation**
2.1	Cinema 1✓	1 RT (1)
2.2	Monday✓	1 RT (1)
2.3	On Sunday✓ at 22:45✓	2 A (2)
2.4	No movie is showing✓✓	2 A (2)
2.5	Sunday✓ and Monday ✓	2 RT (2)
2.6	= 20:15–19:30✓ = 45 minutes✓	1 M 1 A with minutes (2 Answer only) (2)
2.7	= 11:45 + 2 hrs = 13:45 minutes✓ = 14:55–3:45✓ = 1 hour✓ (or 60 minutes)	2 M 1 A with hour/min (3)

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QUESTION 3			
NOTE: Do not subtract a mark for R omitted in question 3.			
Question		**Solution**	**Explanation**
3.1	3.1.1	**<u>Total Maintenance Cost:</u>** = Fuel + Servicing and repairs + Cleaning = R4 815,40 + R846,09 + R500,00✓ = R6 161,49✓ (No marks allocated for amounts copied incorrectly)	1 M 1 A (2 Answer only) (2)
	3.1.2	**<u>Total Income:</u>** = R3 000 + R13 842✓ = R16 842,00✓ (Accept R16 842)	1 M 1 A (2 Answer only) (2)

	3.1.3	**Total expenses:** = R (6 161,49 + 305,45 + 400 + 4 210,50 + 200) ✓ = R11 277,44✓ OR = R4 815,40 + R846,09 + R500,00 + R305,45 + R400 + R4 210,50 + R200) ✓ = R11 277,44✓ (No marks allocated for amounts copied incorrectly)	CA 3.1.1 1 M 1 A (2 Answers only) OR 1 M 1 A (2 Answers only) (2)
	3.1.4	**Net Profit / Loss:** Income – Expenditure = R16 842✓ – R11 277,44✓ = R5 564,56✓ (profit)	CA 3.1.2 and 3.1.3 2 M 1 A (3 Answer only) (3)
3.2	3.2.1	**Total cost on engine oil:** = 5 × R29,50✓ = R147,50✓ (Subtract one if answer is given as R147,5)	1 M 1 A (2 Answer only) (2)
	3.2.2	**Number of air filters:** = R139,50 ÷ R139,50 = 1 air filter✓ *(Full marks for answer only)*	1 A (1)
	3.2.3	**Cost of a spark plug:** = R76,00 ÷ 4✓ = R19,00✓ (Accept R19)	1 M 1 A (2 Answer only) (2)
	3.2.4	**Total VAT amount:** = R551,49✓ × 0,14✓ OR = R551,49✓ × $\frac{14}{100}$ ✓ = R77,21✓ = R77,21✓	2 M 1 A (3 Answer only) (3)
	3.2.5	**Total cost:** = R551,49 + R77,21✓ = R628,70✓ (Subtract one if answer is given as R628,7)	CA 3.2.4 1 M 1 A (2 Answer only) (2)

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QUESTION 4			
Question		**Solution**	**Explanation**
4.1	4.1.1 4.1.2 4.1.3 4.1.4 4.1.5	C✓✓ A✓✓ B✓✓ E✓✓ F✓✓	2 A per question number (10)
4.2	4.2.1	Area = πr^2 = 3,14 $(1,5\ m)^2$✓ = 3,14 $(2,25\ m^2)$ = 7,065 ✓m^2 (Accept 7,06858) = 7,07 m^2✓ (If only answer of 7,07 or 7,065 is given, without units, allocate 2 marks only) (Incorrect radius used: no marks to be allocated)	1 SF 1 A calculation 1 CA (rounding) with units – consider CA only if substitution in formula is correct: 2 marks maximum) (3)
	4.2.2	Perimeter = 3 × 4 m ✓ = 12 m✓ (Answer given as 12 only, allocate 1 mark)	1 SF 1 A 12 m with units (2 Answers only) (2)

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QUESTION 5		
Question	**Solution**	**Explanation**
5.1	= 198 602 + 185 891 + 15 940 + 15 493 + 66 196 + 101 463 + 54 883✓ = 638 468✓ (No marks allocated for numbers copied incorrectly)	1 M 1 A (2 Answers only) (2)
5.2	15 493 ; 15 940; 54 883; 66 196; 101 463; 185 891; 198 602✓ Median = 66 196✓ (accept Sexual offences)	1 M 1 A (2 Answers only) (2)
5.3	P = $\frac{54\,883}{638\,468}$ ✓ ✓ OR = 8,5996% OR = 8,6% ✓✓	CA 5.1 1 M 1 A (2)
5.4	Range = 198 602✓ – 15 493 ✓ Range = 183 109✓	2 M 1 A (3 Answer only) (3)

5.5	Mean = 638 468✓ ÷ 7✓ Mean = 91 209,71✓	CA 5.1 2 M 1 A rounded off to TWO decimal places (3 Answer only) (3)

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QUESTION 6			
NOTE: Do not subtract a mark for R omitted in question 6.			
Question		**Solution**	**Explanation**
6.1		No charge per km for first 1 000 km ✓✓ OR Lorraine has to pay only a flat rate of R2 000,00	2 R/J (2)
6.2		R3,00 charge per km after 1 000 km ✓✓ Hence, the graph increases	2 R/J (2)
6.3		R2 000,00 ✓	1 A (1)
6.4		Cost = R2 000✓ + R3/km travelled **beyond (more than)** 1 000 km✓	2 A (2)
6.5	6.5.1	= R2 000 + (3×300) ✓ = R2 900✓	1 M 1 A (2 Answer only) (2)
	6.5.2	5 000 = 2 000 + 3x x = 3 000 ÷ 3 x = 1 000✓ km Distance = 1 000 + 1 000 = 2 000 ✓km	1 distance charged for (1 000 km) 1 A (2 Answer only) (2)
6.6		$\frac{\text{km travelled}}{10}$ × Cost of 1 litre of petrol Petrol Bill = $\frac{1\,400\text{ km}}{10\text{ km}}$ ✓ × R12/litre✓ = 140 × R12/litre = R1 680,00✓	2 SF 1 A (3 Answer only) (3)

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QUESTION 7		
NOTE: Do not subtract a mark for R omitted in question 7.		
Question	**Solution**	**Explanation**
7.1 (a)	= R1 573,52 + R188,82 ✓ = R1 762,34 ✓	1 M 1 A (2 Answer only) (2)
(b)	$\frac{R1\,762,34}{1} \times \frac{12}{100} = \frac{R21\ 148,08}{100}$ ✓ = R211,48✓	CA 7.1 (a) 1 M 1 A (2 Answer only) (2)
(c)	= R1 762,34 + R211,48✓ = R1 973,82✓	CA 7.1 (a) and (b) 1 M 1 A (2 Answer only) (2)
7.2	End year 6 – Opening balance = R1 973,82✓ – R1 000,00✓ = R973,82✓ OR Add Interest Credited for 6 Years ✓ ✓ R120,00 + R134,40 + R150,53 + R168,59 + R188,82 + R211,48 = R973,82✓	CA 7.1 (c) **<u>Solution 1:</u>** 2 M 1 A **OR** **<u>Solution 2:</u>** CA 7.1 (b) 2 M 1 A R973,82 (3 Answer only) (3)
7.3	$= \frac{R762,34}{R1\,000}$ ✓× $\frac{100}{1}$ ✓ = 76,23%✓ (Question not clear: Accept any amounts given as a fraction and converted to a %. Do not award any marks without an attempt)	2 M 1 A rounded to TWO decimal places (3)

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QUESTION 8			
Question		**Solution**	**Explanation**
8.1	8.1.1	B2✓✓	2 A (2)
	8.1.2	C2✓,C3✓	1 for C2 and 1 for C3 (2)
8.2		West ✓✓	2 A (2)
8.3		1:250 000 28 : *x* ✓ ✓ $x = \frac{28 \times 250\,000}{1\,000\,000}$ ✓ = 7 ✓km	3 M 1 A (4)
8.4		Time = $\frac{7 \text{ km}}{70 \text{ km/h}}$ ✓ = 0,1✓ hour Time = 0,1 × 60 min ✓ = 6 ✓minutes	CA 8.3 1 SF 1 A 1 C 1 A (4)

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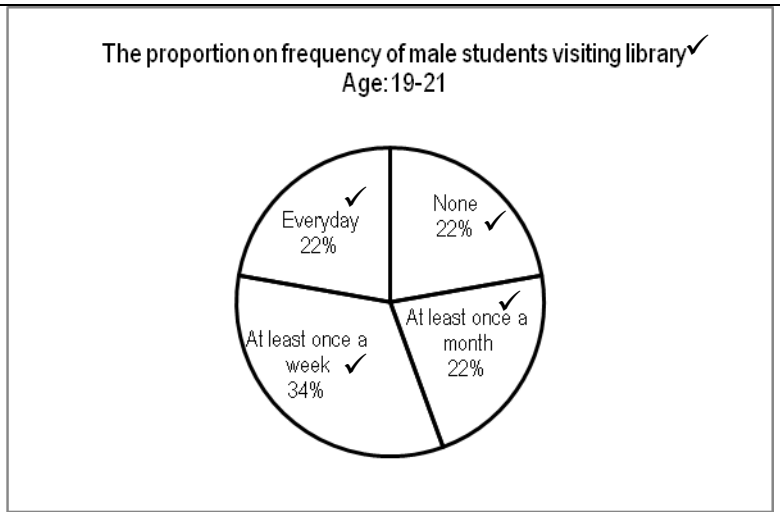
QUESTION 9

Question		Solution	Explanation
9.1		**Please use a tick (✓) to complete the questionnaire* Gender: Female ☐ Male ☑ Age: 16 – 18 ☑ 19 – 21 ☐ How frequent do you visit the college library? Everyday ☐ At least once a week ☑ At least once a month ☐ None ☐	4 A 1 mark for: male, 1: 16-18, 2: at least once week (4)
9.2	9.2.1	(a) = 4 + 9 + 1 + 3 = 17✓	1 A (1)
		(b) = 4 + 4 + 6 + 4 = 18✓	1 A (1)
	9.2.2	Females = 17 + 18 = 35✓ Males = 17 + 8 = 25✓	CA 9.2.1 1 A 1 A (2 Answer only) (2)
	9.2.3	= 25 + 35✓ = 60✓	CA 9.2.2 1 M 1 A (2 Answer only) (2)
	9.2.4	P = $\frac{35}{60}$ ✓ = $\frac{7}{12}$ ✓ or 58,33%✓ ✓✓ (If answer given is $\frac{25}{60}$ = $\frac{5}{12}$, allocate only 2 marks)	2 M 1 A (3)

	9.2.5	 (The pie-chart above is for females which is incorrect)	1 title 2 Correct labels/Legend 2 Correct proportion (percentages) (Question not clear: Give 1 mark for correct title; 2 marks for correct labelling of 2 segments; 2 marks for figures indicated on chart) NOTE: (Male: 19 – 21) None: 12,5% (1) At least once a month: 50% (4) At least once a week: 37,5% (3) Every day: 0% (0) (5)

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TOTAL: 150