higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

NOVEMBER EXAMINATION 2011

MATHEMATICAL LITERACY (First Paper)
NQF LEVEL 3

8 NOVEMBER 2011

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 9 pages.

QUESTION 1 [30]

Question		Solution	Explanation
1.1	1.1.1	= 663✓✓	2 A solution (2)
	1.1.2	0,36 + 6✓ = 6,36✓	1 S simplify (Do not carry mistake forward) 1 A solution (2 marks answer only) (2)
	1.1.3	=3 x 8✓ = 24✓	1 S simplify (Do not carry mistake forward) 1 A solution (2 marks answer only) (2)
1.2	1.2.1	Sand: 4x = 4 ∴ x = 1 ✓✓ Cement: 4y = 2 ∴ y = ½ ✓	3 A solution (3)
	1.2.2	= (32 ÷ 85) × 100 ✓ = 37,6 % or 38% or 37,65 ✓	1 M method 1 A solution (2)
	1.2.3	= 4,5 x 1000 ✓ = 4 500g✓	1 M method 1 A solution (2 marks answer only) (2)
	1.2.4	8 bars= R48 ∴ 1 bar = R6✓ = R6 × 12 = R72✓	1 M method 1 A solution (2 marks answer only) (2)
1.3	1.3.1	Percentage increase $= \frac{R4{,}00 - R3{,}35}{3{,}35} \times 100$ ✓ ✓ = 19,4 **or** 19%✓	2 M method 1 A solution (3 marks answer only) (3)
	1.3.2	= R120 – (R120 × 0,2) ✓ = R120 – R24 ✓ = R96,00✓ or = R120✓ × 0,8✓ = R96,00✓	2 M method 1 A solution (3 marks answer only) (3)
1.4	1.4.1	$= \frac{6\,000 + 6\,200 + 7\,900 + 7\,300}{4}$ ✓✓ = 6 850✓	One mark for method: addition One mark for denominator 1 A solution (3 marks answer only) (3)
	1.4.2	= 2 000 m^2✓✓	2 A solution (Do not subtract a mark for units omitted/incorrect) (2)

1.5	1.5.1	Perimeter = 4 + 3 + 4 + 3 m✓ = 14 m ✓ **Or** 2(l + b) = 2 (4 + 3) ✓ = 14 m ✓	1 M method 1 A solution (2 marks answer only) (Do not subtract a mark for units omitted/incorrect) (2)
	1.5.2	V = 5 × 3 × 12✓ V = 180 cm^3✓	1 SF substitution in formula 1 A solution (2 marks answer only) (Do not subtract a mark for units omitted/incorrect) (2) **[30]**

QUESTION 2 [15]

Question	**Solution**	**Explanation**
2.1	= 6 ✓	1 A solution (1)
2.2	= R100 ✓✓	2 A solution (Do not subtract a mark for units omitted) (2)
2.3	= 2011-11-01 ✓✓	2 A solution (2)
2.4	✓ ✓ = (100) + (1 ×40) + (2 × 20) = R180✓	Carry forward ONE mistake only 2 method 1 A solution (3)
2.5	FV = $R82\,600(1+0{,}05)^{10}$ ✓ FV = R82 600 × 1,6289✓ **or** R82 600 × 1,63 FV = R134 547,14 ✓ = R134 638 or R134 547,70	1 substitution 1 simplify 1 A solution (3)
2.6	FV = $R100\,000\left(1+\frac{\frac{12}{4}}{100}\right)^{12}$ ✓✓ or $R100\,000\left(1+\frac{3}{100}\right)^{12}$ FV = R100 000 × 1,42576✓ **or** R100 000 × 1,43 FV = R142 576,00 ✓ or = R142 576,09 or = R143 000,00	2 substitution (one mark for i = 0,03/ $\frac{3}{100}$ and one mark for 12) 1 simplify 1 A solution (4) **[15]**

QUESTION 3 [18]

Solution	Solution	Explanation
3.1	Electricity✓, waste removal✓, water service and sewerage Any 2 of the above given services	2 A solution (2)
3.2	Payment or Credit✓✓	2 A solution (2)
3.3 a)	= 52,83 – 46,34 ✓ = 6,49✓	1 method 1 A solution (2 marks answer only) (2)
b)	= 54,63 – 6,71 ✓ = 47,92✓	1 M method 1 A solution (2 marks answer only) (2)
c)	= 439,81 + 46,34 + 131,35 + 47,92✓ = 665,42✓	Carry forward with mistake in (b) 1 M method 1 A solution (2 marks answer only) (2)
d)	= 61,57 + 6,49 + 18,39 + 6,71✓ = 93,16✓	Carry forward with mistake in (a) 1 M method 1 A solution (2 marks answer only) (2)
e)	= 501,38 + 52,83 + 149,74 + 54,63✓ = 758,58✓	1 M method 1 A solution (2 marks answer only) (2)
3.4	Total Payable = Total charges – Credits Total Payable = 758,58 – 2,97✓ Total Payable = 755,61✓	Allocate 2 marks for any attempt in Question 3.3 (mistake on Question paper) 1 M method 1 A solution (2)
3.5	VAT% = (61,57 ÷ 439,81) × 100 ✓ VAT% = 0,13999 × 100 VAT% = 14%✓ Check various alternative methods (VAT can also be calculated on waste removal, water service or sewerage)	1 M method 1 A solution (No marks to be allocated without calculations shown, e.g. no mark for 14% only) (2) **[18]**

QUESTION 4 [14]

Solution	Solution	Explanation
4.1	radius = 130cm ÷ 2 = 65cm✓	1 solution (Do not subtract a mark for units omitted) (1)
4.2	= 3,142 × $(65)^2$ × 188,325✓ = 2 500 004,959 ✓cm^3✓ or = 3,14 × $(65)^2$ × 188,325✓ = 2 498 413,613 ✓cm^3✓	Carry forward mistake in 4.1 1 substitution 2 solution with unit cm^3 (Do not subtract a mark if 3,14 was used) (Accept answers rounded off to whole number, first or second decimals) (3)
4.3	= 2 500 004,959 ÷ 1 000✓ = 2 500✓	Carry forward mistake in 4.2 1 M method 1 A solution (2)
4.4	= (2÷3) × 2 500✓ = 0,6667 × 2 500✓ = 1666,667 litres✓	Carry forward mistake in 4.3 (Do not carry mistake again after second mistake) 2 M method 1 A solution (Do not subtract a mark for units omitted) (3)
4.5	= 6,5 ×2500✓ = 16 250 litres✓	Carry forward mistake in 4.3 1 M method 1 A solution (Do not subtract a mark for units omitted) (2)
4.6	✓ ✓ 2 500 × 1 000 = 125 × 100 × height Height = $\frac{2500000}{125\times100}$ Height =200 cm✓	1 Conversion 1 S substitution 1 A solution (3) **[14]**

QUESTION 5 [15]

	Question	Solution	Explanation
5.1	5.1.1	✓ ✓ = 1990÷7 = 284,3 or 284,29 or 284✓	2 method 1 solution (3)
	5.1.2	150 250 300 300 320 320 350 ✓ = 300✓	1 Arranging in ascending order 1 A solution (2)

	5.1.3	✓ ✓ 300 and 320	2 A solution (2)
	5.1.4	✓ ✓ = 350 - 150 = 200 ✓	2 method 1 A solution (3 marks for answer only) (3)

5.2	5.2.1 a)	8 times ✓	1 A solution	(1)
	b)	7 times ✓	1 A solution	(1)
	5.2.2	$= \frac{5}{5+7+8}$ ✓✓ = 25% or 0,25 or $\frac{5}{20}$ *or* $\frac{1}{4}$ ✓	1 mark numerator, 1 mark denominator 1 solution (accept solution in words, e.g. 5 out of twenty) (3 marks for answer only)	(3) **[15]**

QUESTION 6 [12]

	Question	**Solution**	**Explanation**
6.1	6.1.1	✓ ✓ = 160 + 40(3) = R280✓	2 S substitution in formula 1 A solution (3 marks for answer only) (3)
	6.1.2	360 = 160 + 40n✓ 40n = 360 – 160✓ n = 5✓	1 S substitution in formula 1 Manipulation 1 A solution (3 marks for answer only) (3)
	6.2.1	June✓✓	2 A solution (2)
	6.2.2	R2 500✓✓ (Accept any value between R2 500 – R2 700)	2 A solution (Do not subtract a mark for Rand omitted) (2)
	6.2.3	March✓✓	2 A solution (2) **[12]**

QUESTION 7 [16]

Question	Solution	Explanation
7.1	= R600✓	1 A solution (1)
7.2	= R720✓✓	2 A solution (Do not subtract a mark for Rand omitted) (2)
7.3	= 720 - 600✓ = 120✓	Carry forward mistake in 7.2 1 M method 1 A solution 2 marks for answer only (2)
7.4	Increases ✓✓	2 A solution (2)
7.5	= R720 × 52✓✓ = R37 440✓	Carry forward mistake in 7.2 2 M method 1 A solution (Do not subtract a mark for Rand omitted) 3 marks for answer only (3)
7.6	✓ ✓ = $120 \div 600 \times 100$ or $\frac{720-600}{600} \times 100$ = 0,2 × 100 = 20%✓	2 M method 1 A solution (No marks for 20% without calculations) (3)
7.7	FV = $600(1+0,2)^5$ ✓✓ FV = R1 492,99✓	1 mark for 0,2 or $\frac{20}{100}$ 1 mark for 5 1 A solution (Do not subtract a mark for Rand omitted) (3) **[16]**

QUESTION 8 [13]

	Question	Solution	Explanation
8.1	8.1.1	= 8 × 3 m✓ = 24 m✓	1 M method 1 A solution (2 marks answer only) (2)
	8.1.2	= 6 × 3 m✓ = 18 m✓	1 M method 1 A solution (2 marks answer only) (2)

8.2	A = 24×18✓ A = 432✓ m^2✓	1 SF substitution in Formula 1 U unit 1 A solution (3)
8.3	Cost = 432✓× R70✓ Cost = R30 240 ✓	Carry forward mistake in 8.2 2 M method 1 A solution (3)
8.4	$x = \sqrt{4^2 + 25^2}$ ✓ $x = \sqrt{641}$ ✓ x = 25,318 ✓ or 25,3 or 25	1 SF substitution in Formula 1 simplify 1 A solution (3 marks for answer only) (3) **[13]**

QUESTION 9 [17]

	Question	**Solution**	**Explanation**
9.1	9.1.1	Check measurements again after the final paper has been printed. 2,7 cm = 180 km✓ 1 cm = 66,7 km✓	 1 A measurement 1 A scale (2)
	9.1.2	Range: [1,0 – 1,5] cm✓ = [66,7 – 100,05] km✓	1 A measurement 1 A distance (2)
	9.1.3	133+86 ✓= 216 km✓ **or** 190 to 220 km if scale has been used✓✓	1 RM distances 1 A (2 marks answer only) (2)
	9.1.4	South West✓✓	2 A solution (2)
9.2	9.2.1	99 332 – 99 108✓ = 224 km✓	1 M method 1 A solution (2 marks answer only) (2)
	9.2.2	99 388 – 99 108✓ = 280 km✓	1 M method 1 A solution (2 marks answer only) (2)

	9.2.3	= 16:30 – 14:00✓ = 2,5 hours✓ or 2h30min	1 M method 1 A solution (2 marks answer only) (2)
	9.2.4	Speed = 280 ÷ 2,5 ✓✓ Speed = 112 km/h✓	Carry mistakes in 9.2.2 and 9.2.3 2 M substitution 1 A solution 3 marks for answer only (3) **[17]**

TOTAL: 150