higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

NOVEMBER EXAMINATION 2012

MATHEMATICAL LITERACY
(Second Paper)
NQF LEVEL 3

6 NOVEMBER 2012

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.

Note:

- **Only penalise <u>once</u> (-1) for omitting of the unit 'Rand' in the entire question paper.**

QUESTION 1 [58]				
Question		**Solution**		**Explanation**
1.1	1.1.1	$= \frac{69,75 - 52,5}{52,5} \times 100\%$ ✓ ✓ $= 32,86\%$✓ *(Do not penalise for omitting %)*		2 S 1 A Answer only: No marks (3)
	1.1.2	In year 2007 – 2008 **the price** of floor tiles **decreased**✓✓		2 E (2)
	1.1.3 a)	$A = \frac{69,75 - 58}{58} \times 100\%$ ✓ ✓ $A = 20,26\%$✓ *(Do not penalise for omitting %)*		2 M 1 A Answer only: 3 marks (3)
	b)	Increase = 238,95 × 17,18%✓ Increase = R41,05✓ B = 238,95 + 41,05 B = R280,00✓ OR 238,95 × 117,18%✓✓ B = R280,00✓	OR ✓ $\frac{B - 238,95}{238,95} \times 100\% = 17,18\%$ B – 238,95 = 41,05✓ B = R280,00✓	2 M 1 A Answer only: 3 marks (3)
	1.1.4	Average % over 3 years $\text{Average \%} = \frac{32,86 + 40,04 + 20 + 94,44 + 19,59 + 40}{6}$ ✓ ✓ Average % = 41,16%✓ *(Do not penalise for omitting %)*		1 A sum 1 M (÷ 6) 1 A CA Answer only: 3 marks (3)
	1.1.5	Average % 2008 – 2009 $\text{Average \%} = \frac{20,26 + 17,18 + 20 + 52,17 + 22,25 + 23,53}{6}$ ✓ ✓ Average % = 25,9 ✓ % New labour cost in 2010 New labour cost = R27 000 × 1,259✓ New labour cost = R33 993,00✓		1 A sum 1 M (÷ 6) 1 A 1 M 1 CA (5)

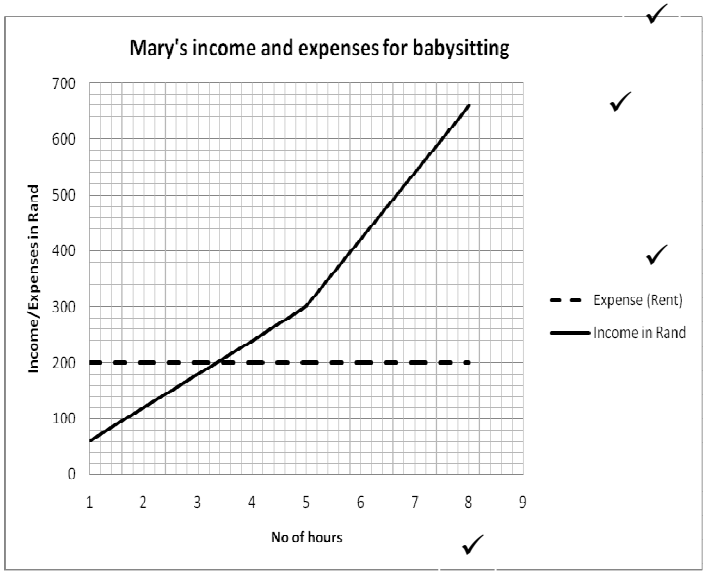
Question		Solution	Explanation
1.2	1.2.1	Annual interest rate = 7,2✓ % *(accept 7.2%: given)* Monthly interest rate = 7,2% ÷ 12 ✓= 0,6%	1 annual interest 1 method (2)
	1.2.2	24 months✓	1 A (1)
	1.2.3	✓ ✓ $= R10\,000 \times \frac{0,6}{100}$ = R60,00✓	2SF 1 A (3)
	1.2.4	= R10 181,08✓ + R61,09✓ = R10 242,17	2 M (2)
	1.2.5 a)	$= R10\,242,17 \times \frac{0,6}{100}$ ✓ = R61,45✓ OR R10 303,62 - R10 242,17 ✓ = R61,45✓	1 SF 1 A Answer only: 2 marks (2)
	b)	= R10 303,62 + R61,82✓ = R 10 365,44✓	1 M 1 A Answer only: 2 marks (2)
	1.2.6	$i = \frac{7,2}{100}$ ✓ = 0,072 ✓ A = 10 000(1+0,072)^2 ✓ A = R11 491,84✓ OR ✓ ✓ ✓ A = 10 000(1+0,072)^2 A = R11 491,84✓	3 SF CA 1 A Answer only: 4 marks 3 SF CA 1 A (4)
1.3	1.3.1	= 8 500 000 ÷ 1 000 000✓✓ 1 mm = 8,5km	2 MA (2)
	1.3.2	East Northeast or Northeast✓✓	2 A (2)

	1.3.3	= 46✓ mm (OR 4,6 cm) Distance = 46 × 8,5✓ = 391✓ km. *(Accept measurements from 44 – 48mm)* Measure the actual paper and determine the distance at marking centre as the size of the picture might change *(Do not penalise for units omitted)*	1 A measurement 1 M 1 A (3)
	1.3.4	7 mm + 17 mm = 24✓ mm (OR 2,4 cm) *(Accept measurements from 22 – 26mm)* Distance = 24 mm × 8,5✓ = 204 ✓km. *(Do not penalise for units omitted)*	2 M 1 A (3)

Question		**Solution**	**Explanation**
1.4	1.4.1	Usage in hours by **electrical appliances**✓✓ Consider any other reasonable title.	2 A (2)
	1.4.2	Kettle $= \frac{3}{17,5} \times 100\%$ ✓✓ = 17,14% OR ✓ ✓ 100% - (40% + 17,14% + 25,72%) = 17,14%	1 M 1 Sum of hrs = 17,5 (2)
	1.4.3	Accept any appliance mentioned / learner indicated 'no appliance missing'✓✓✓ *(Mistake on question paper)*	3 Identification (3)
	1.4.4	Bar graph✓ In the pie chart the values are represented in percentages✓✓ Any other reasonable justification	1 A 2 R/J (3)
	1.4.5	No, ✓ Some appliances use less electricity than others. It depends on resistor factors ✓✓ *Also accept 'Yes' with any reasonable justification.*	1 A 2 R/J (3)
			[58]

QUESTION 2 [23]			
Question		**Solution**	**Explanation**
2.1	2.1.1	= R2 499 + R500✓ = R2 999✓	1 M 1 A Answer only: 2 marks (2)
	2.1.2	Discount = $\frac{500}{2999}$ ✓×100%✓ Discount = 16,67%✓	CA with mistake in 2.1.1 2 M 1 A Answer only: 3 marks (3)
	2.1.3	Option A✓ Option B = R250 + (R140 × 24) ✓ Option B = R3 610✓	CA with mistake in 2.1.1 1 A (option A) 2 J (3)
	2.1.4	= R3 610 – R2499 ✓ = R1 111✓	CA with mistake in 2.1.3 1 M 1 A Answer only: 2 marks (2)
2.2	2.2.1	R7,59✓ *(Do not penalise for R omitted)*	1 RT (1)
	2.2.2	= $\frac{2499}{7,59}$ ✓ = 329,25✓ US$	1 M 1 A Answer only: 2 marks (2)
	2.2.3	= $\frac{2499}{7,59}$ ✓× 7,19✓ = 2 367,30✓ Pula	2 M 1 A Answer only: 3 marks (3)
	2.2.4	Total cost = 300 + 30✓ = 330US$✓ Total cost in rand = 330 × 7,59✓ = R2 504,70✓	2 M 2 A Answer only: 4 marks (4)
	2.2.5	Disagree, ✓ The difference in price is = R5,70 It is cheaper not waiting for three weeks Any other reasonable justification✓✓	1 A 2 R/J (3)
			[23]

QUESTION 3 [26]			
Question	**Solution**		**Explanation**
3.1	= R20,00 × 3✓ = R60,00✓		1 M 1 A Answer only: 2 marks (2)
3.2	= R20,00 × 3 × 3✓ = R180,00✓		1 M 1 A Answer only: 2 marks (2)
3.3	5th ✓✓		2 A (2)
3.4	The rate per hour has doubled after 5 hours. ✓✓		2 A (2)
3.5	Double = R20,00 × 2 = R40,00✓✓		2 A (2)
3.6	= (2 × R20)5 hrs✓ + (2 × R40)1 hr✓ = R200 + R80✓ = R280,00✓		3 M 1 A (4)
3.7	Key: N = No. of children h = hrs within 5 hrs H = hrs beyond 5 hrs✓ Earning = (N × R20)h✓ + (N × R40)H✓ Full marks if formula is correctly given in words.		1 Key 2 A (3)
3.8	R240 = (N × R20)3✓ + (N × R40)0 R240 = R60n + 0✓ N = 4 children✓		1 SF 1 M 1 A (3)
3.9	3.9.1	= (3 × R20)5 hrs + (3 × R40)3 hr = R300 + R360✓ = R660,00✓	1 M 1 A Answer only: 2 marks (2)

	3.9.2		1 Title 1 line graph 1 Legend 1 label for BOTH x- and y-axis (4)
			[26]

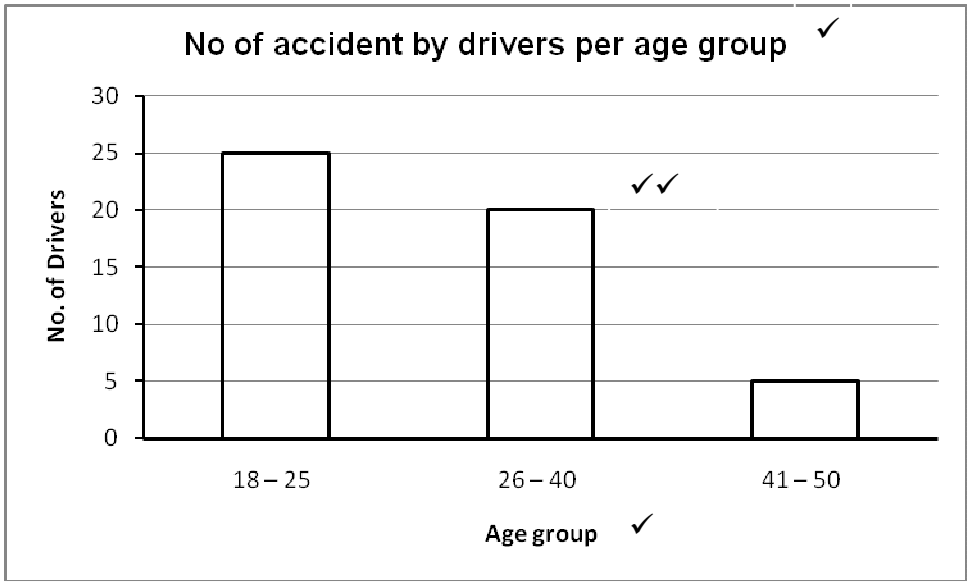
QUESTION 4 [22]

Note: Penalise <u>once</u> (-1) for omitting any unit e.g. km, m, mm, cm etc. in question 4.

Question	Solution		Explanation
4.1	Length = 6 m – 3,8 m ✓= 2,2 m✓ Breadth = 3,1 m✓		1 M 2 A Answers only: 3 marks (3)
4.2	Area = 3,1 × 2,2✓ Area = 6,82 m^2✓		CA 1 SF 1 A(with unit) Answers only: 2 marks (2)
4.3	4.3.1	400 mm ÷ 1000 ✓= 0,4 m✓	1 M 1 A Answers only: 2 marks (2)
	4.3.2	Area = 0,4 × 0,4✓ Area = 0,16✓ m^2	CA 1 M 1 A Answers only: 2 marks (2)

	4.3.3	Area to be covered by 1 box Area = 0,16 × 10✓ Area = 1,6 ✓m^2 No. of boxes required $=\frac{11,78}{1,6}$ ✓ (denominator) ✓ (numerator) = 7,36 boxes✓ = 8 boxes ✓	CA 2 Area (1 box) 2 M 1 A 1 A (Rounding up) (6)
	4.3.4	No ✓ The number of boxes were already rounded up by 0,64 while 5% of 7,36 = 0,37✓✓ Any other suitable justification	1 A 2 R/J (3)
	4.3.5	Total cost = (R99 × 8 boxes) + (R60 × 11,78) ✓ Total cost = R792,00✓ + R706,80✓ Total cost = R1 498,80✓	CA 1 M 2 A (Individual costs) 1 A (Total cost) (4)
			[22]

QUESTION 5 [21]			
Question	**Solution**		**Explanation**
5.1	A = 150 – 50 – 35 ✓ A = 65✓	A = 200 – 115 – 20 ✓ A = 65✓	1 M 1 A Answers only: 2 marks (2)
5.2	B = 25 + 20 + 5✓ B = 50✓	B = 500 – 300 – 150 ✓ B = 50✓	1 M 1 A Answers only: 2 marks (2)
5.3	C = 75 + 50 + 25✓ C = 150✓	C = 500 – 200 – 150 ✓ C = 150✓	1 M 1 A Answers only: 2 marks (2)
5.4	5.4.1	$=\frac{150}{500}$ $OR = \frac{3}{10}$ OR 0,3 OR 30%✓✓	2 A (2)

	5.4.2	$=\frac{65}{200} OR \frac{13}{20}$ OR 0,65 OR 65%✓✓	CA 2 A (2)
	5.4.3	$=\frac{75}{150} OR \frac{1}{2}$ OR 0,5 OR 50%✓✓	CA 2 A (2)
5.5	Accident-free probabilities per age group (18 – 25) = 50% (26 – 40) = 57,5% (41 – 50) = 73,33%✓ Age group 41 – 50 are better drivers✓ They have 73,33% accident-free chances✓		1 A 2 R/J (3)
5.6	50% of this age group are not involved in accidents and there are more drivers with 1 accident than 2✓✓ Any other suitable explanation.		2 E (2)
5.7			
			1 Title 2 Correct Bar graph 1 label BOTH x & y-axis (4)
			[21]

TOTAL: 150