



NATIONAL SENIOR CERTIFICATE EXAMINATION
NOVEMBER 2009

MATHEMATICAL LITERACY: PAPER I

MARKING GUIDELINES

Time: 3 hours

150 marks

These marking guidelines were used as the basis for the official IEB marking session. They were prepared for use by examiners and sub-examiners, all of whom were required to attend a rigorous standardisation meeting to ensure that the guidelines were consistently and fairly interpreted and applied in the marking of candidates' scripts.

At standardisation meetings, decisions are taken regarding the allocation of marks in the interests of fairness to all candidates in the context of an entirely summative assessment.

The IEB will not enter into any discussions or correspondence about any marking guidelines. It is acknowledged that there may be different views about some matters of emphasis or detail in the guidelines, and different interpretations of the application thereof. Hence, the specific mark allocations have been omitted.

Please note that learners who provided alternate correct responses to those given in the marking guidelines will have been given full credit.

PENALTIES FOR THE ENTIRE PAPER

P1	Measurement units missing, e.g. cm, km, m, mm, pounds
P1	Money unit missing, e.g. R or \$ sign
P1	Rounding off → General rounding
P1	2 Decimal places for money. If R2,9 is written instead of R2,90.

**** The above penalties are given as a once off, not on every occurrence. ****

Question	Possible answer	Marking allocation	Taxonomy Level		
			L1	L2	L3
Question 1 12.1.1 12.1.2 12.1.3 12.2.1 12.3.1 12.3.2					
1.1.1	$= \frac{1}{3} - \frac{1}{12} \text{ m}$ $= \frac{1}{4}$	Working out Simplification	2		
1.1.2	$7 + 3 (9 - 2)$ $7 + 3 \times 7$ $7 + 21 = 28$	Working out Simplification	2		
1.2	$\frac{480}{200} = \frac{36}{x}$ $480x = 7\,200 \text{ m}$ $\frac{480x}{480} = \frac{7\,200}{480}$ $x = 15$ OR $480 : 200 = 36 : x$ $480 \times x = 200 \times 36$ $x = \frac{200 \times 36}{480}$ $x = 15$ OR $48 : 20 = 36 : x$ $12 : 5 = 36 : x$ $36 : 15 = 36 : x \quad x = 15$	Working out Simplification		2	
1.3	$1,46 \times 10^8$ OR $(10^{-8}) 0$	Working out		2	
1.4.1	$= \frac{28}{100} \times \text{R}2\,859,50 \text{ m}$ $= \text{R}800,66$	Working out Simplification	2		

1.4.2	$= 45 \times 2,2046 \text{ pounds}$ $= 99,21 \text{ pounds}$ $= 99 \text{ pounds rounded answer}$	Method Simplification	1	1	
1.4.3	$C = R \left(1\,000 + \frac{9}{2} \times 300 \right)$ $C = R2\,350,00$	Substitution Simplification	1	1	
1.5	Radius = $5,5 \text{ m} \div 2 = 2,75 \text{ m}$ Volume = $\pi \times (2,75 \text{ m})^2 \times 1,2 \text{ m}$ Volume = $28,5 \text{ m}^3$	Diameter to radius Substitution Simplification	1	2	
1.6	75 kg of sugar: 50 kg of butter = 3:2 m 125 kg of sugar: x kg butter OR $\frac{3}{2} = \frac{125}{x}$ $3x = 250$ $x = 83,33 \text{ kg} = 83 \text{ kg of butter}$ OR 84 kg OR $75 : 50 = 125 : x$ $\frac{125 \times 50}{75} = x$ $x = 83,33 \text{ kg}$ 83 kg = x OR 1 kg for $\frac{2}{3}$ kg of butter $\therefore 125 \text{ kg} \times \frac{2}{3} = 83 \text{ kg}$	Method of ratio Calculation Rounding to nearest kg	1	2	
1.7	$\frac{4}{5} \times R6\,800 = R5\,440$ OR $\frac{1}{5} \times R6\,800 = 1360$ 6800 – 1360 = 5440	Multiplication by $\frac{4}{5}$ Simplification	1	1	

1.8	$\frac{50}{2,5} \times 5 \text{ minutes} = 100 \text{ minutes}$ $= 1 \text{ hour } 40 \text{ minutes}$	Multiply by 5 Divide by 2,5 Convert	2	1	
1.9.1	$R4\,999 \times 10\% \text{ m} = R499,90$	Multiplication by 10% Simplification	2		
1.9.2	$R289 \times 36 \text{ months m} = R10\,404$	Multiplication by 12 Simplification	1	1	
1.9.3	$R499,90 + R10\,404 \text{ ca} = R10\,903,90$	Addition of 1.9.1 and 1.9.2 for fridge price Simplification	1	1	
		SUBTOTAL	17	14	
Question	Possible answer	Marking allocation	Taxonomy Level		
			L1	L2	L3
	Question 2 12.1.1 12.1.2 12.1.3 12.2.1 12.2.2 12.3.1 12.3.2 12.4.4				
2.1.1	$R246,80 \times 12 \text{ m} = R2\,961,60$	Multiplication by 12 Simplification	2		
2.1.2	$R695,00 \times 4 \text{ m} = R2\,780$ OR $R2\,780 + R198,50 = R2\,978,50$ OR $R2\,780 + R798 = R3\,574$	Multiplication by 4 Simplification	2		

2.1.3	$R255,15 + R2780 + R495,50 + R2961,60 + R198,50 + R364,00 \text{ m ca}$ $= R7\ 054,75$	Method Total Cost	2	1	
2.1.4	$R7\ 054,75 \div 10\ 265 \text{ m ca} = 69 \text{ cents}$ OR $\div \text{m} \frac{10265}{7054,75} = R1,46$ If wrong way around only 1 mark	Method Cost per kilometre	2	1	
2.2.1	Volume = $12 \text{ m} \times 0,6 \text{ m} \times 0,1 \text{ m sub} = 0,72 \text{ m}^3$	Substitution in volume formula Simplification	1	1	
2.2.2	$0,72 \text{ m}^3 \div 0,027 \text{ m}^3 = 26,67 \text{ bags} = 27 \text{ bags}$ m rounding	Method of $\div$ by 0,027 Rounding of to whole number for bags		2	
2.2.3	$27 \times R169,99 \text{ ca} = R4\ 589,73$ OR $26,67 \times R169,99 = 4533,63$ $26 \times R169,99 = 4419,74$ $4419,74 = 220,99$	Method of multiplying by number of bags Simplification	1	1	
2.2.4	$R4\ 589,73 \times 5\% \text{ ca} = R229,49$ OR $R4589,73 - R229,49 = R4360,24$	Method of multiplying by 5% Simplification		2	
		SUBTOTAL	10	8	0

Question	Possible answer	Marking allocation	Taxonomy Level		
			L1	L2	L3
Question 3 12.1.1 12.1.2 12.1.3 12.2.1 12.3.1 12.3.2					
3.1	$400 \text{ mm} \div 1000 = 0,4 \text{ m}$ OR $A = \frac{1}{2} \times 400 \times 400 \text{ mm}^2$ $\text{Area} = \frac{1}{2} \times 0,4 \times 0,4$ $\text{Area} = 0,08 \text{ m}^2$	Conversion of mm to m Substitution into area formula Simplification	2	1	
3.2	$QR^2 = 0,4^2 + 0,4^2 \text{ m ca}$ OR $QR^2 = (400^2 + 400^2) \text{ mm}^2$ $QR^2 = 320\,000 \text{ mm}^2$ $QR = 565,69 \text{ mm}$ $QR = 0,57 \text{ m}$	Method ca for conversion of mm to m Simplification		2	1
3.3	$0,57 \text{ m} + 0,4 \text{ m} + 0,4 \text{ m}$ $= 1,37 \text{ m}$ OR $(576,09 + 400 + 400) \text{ mm}$ $= 1\,376,09 \text{ mm}$ $= 1,38 \text{ m}$	Method, perimeter Simplification	2	1	
3.4	$3 \text{ min} + 2 \text{ min } 45 \text{ sec} + 3 \text{ min } 15 \text{ sec} = 9 \text{ minutes per placemat}$ Accept 8 min 60 seconds OR $(3 \times 60 + 2 \times 60 + 45 + 3 \times 60 + 15) \text{ sec}$ $= 540 \text{ seconds} = 9 \text{ minutes per placemat}$	Method Conversion of minutes to seconds simplification	2	1	
3.5	$\frac{3}{9} = \frac{1}{3}$ mca of the denominator from 3.4 OR $\frac{3 \times 60}{540} = \frac{1}{3}$ OR $\left[\frac{3}{9} \right]$	Method Simplification	1	1	

3.6	$60 \text{ minutes} \div 9 \text{ minutes per placemat} = 6,67 = 6 \text{ placemats}$ OR $60 \text{ min} \div (8 \text{ min } 60 \text{ sec}) = 6,67 = 6 \text{ placemats}$	Method Simplification Rounding down	1	2	
3.7	$6 \times R4,20 = R25,20$	Method Simplification Method Simplification	1 1	1 1	
3.8	$R129,95 \div 8,13 = \$15,98$	SUBTOTAL	10	10	1

Question	Possible answer				Marking allocation	Taxonomy Level		
						L1	L2	L3
	Question 4 12.1.1 12.1.2 12.1.3 12.2.1 12.2.2 12.2.3 12.4.4							
4	Costs involved with purchase of house							
		MARK ALLOCATION	Amount	Calculation required	Final Amount Due			
	4.1	Method of finding 30% of salary Division of 0,3 Simplification	Minimum monthly salary	$\frac{30}{100}$ of salary = R14 502 $0,3 \times \text{salary} = \text{R14 502 m}$ Salary = R14 502 ÷ 0,3 = R48 340 per month OR 30% = R14 502 10% = R483,40 100% = R48 340		1	2	1
	4.2	Method of multiplying by 8% + R25000 to get final answer Simplification Final answer	Transfer Fee	R25 000 + 8% of R200 000 = R25 000 + R16 000 = R41 000	R25 000 + R16 000 = R41 400	1	2	1
	4.3	Adding VAT Simplification	Security Assessment fee	= R1 315,00 + vat of 14% = R1 499,10	R1 499,10	1	1	
	4.4	Choosing correct value	Home loan initiation fee	R1 250	R1 250	1		
	4.5	Choosing correct value	Deeds office registration fee	R500	R500	1	2	
	4.6	Method of adding values Simplification		Final Amount Due for Hidden Costs	R44 249,10			
	SUBTOTAL					6	7	2

Question	Possible answer	Marking allocation	Taxonomy Level														
			L1	L2	L3												
	Question 5 12.1.1 12.1.2 12.1.3 12.2.2 12.2.2 12.2.3 12.4.4																
5.1	$A = P \left(1 - \frac{r}{100} \right)^n$ $A = R100\,000 \left(1 - \frac{25}{100} \right)^n$ <table border="1"> <thead> <tr> <th>Time in years</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th></tr> </thead> <tbody> <tr> <td>Value of the car in Rands</td><td>75 000</td><td>56 250</td><td>42 187,50</td><td>31 640,63</td><td>23 730,47</td></tr> </tbody> </table> If order is swapped, i.e. T = 1 R = 750 000, then give full marks.	Time in years	1	2	3	4	5	Value of the car in Rands	75 000	56 250	42 187,50	31 640,63	23 730,47	calculation of values correct substitution	4	4	
Time in years	1	2	3	4	5												
Value of the car in Rands	75 000	56 250	42 187,50	31 640,63	23 730,47												
5.2	Depreciation of Mr Dlamini's Car	horizontal axis label vertical axis label heading of graph values (scales) on horizontal, vertical axis plotting points lines joining	5	3													
5.3	The letter A on the graph above. (on valued axis)	value		1													
		SUBTOTAL	9	8	0												

Question	Possible answer	Marking allocation	Taxonomy Level		
			L1	L2	L3
	Question 6 12.2.1. 12.2.2 12.2.3 12.4.1 12.4.3 12.4.4				
6.1	UK 1948 and Australia 1956				
6.2	7	Correct value	1	1	
6.3.1	5	Correct value	1	1	
6.3.2	2	Correct value	1	1	
6.3.3	$230 \div 7 = 32,86\%$	Method Simplification	1	1	
6.3.4	$207 \div 7 = 29,57\%$	Method Simplification	1	1	
6.3.5	$\frac{32,86 - 29,57}{29,57} \times 100\% = 11,13\%$ OR $32,86\% - 29,57\%$ $= 3,29\%$	Method Rounding Simplification	1		2

6.3.6	Bar graph showing gold medals won when hosting & not hosting games Handwritten labels: 'COUNTRIES' and a legend for 'Hosting' (hatched) and 'Not hosting' (solid).	horizontal axis label vertical axis label heading of graph values on horizontal and vertical axis drawing of the bars	5	2	2
		Subtotal	11	9	4
Question	Possible answer	Marking allocation	L1	L2	L3
	Question 7 12.1.1 12.1.2 12.1.3 12.4.1 12.4.3 12.4.4				
7.1	KwaZulu-Natal		1		
7.2	$= 366\,201 \div 9$ $= 40\,689$	Sum of values and division by 9 Simplification	1	2	

7.3	$= 11\,290 - 184$ $= 11\,106$	Subtraction of values Simplification	1	1	
7.4	1 034 719 263 086; 656 074; 765 762; 937 887; 1 034 719; 1 716 196; 1 735 806; 2 037 777; 2 725 855	Order the numbers Select middle number	1	1	
7.5	$\frac{5}{9} \times 100\% = 55,56\%$	number of provinces x percentage simplification	1	1	1
			5	5	1
Question	Possible answer	Marking allocation	Taxonomy Level		
			L1	L2	L3
	Question 8 12.4.5 12.1.1 12.3.1 12.3.2				
8.1.1	$\frac{3}{9} = \frac{1}{3}$ OR 0,3 OR 33,3% $\left[\frac{3}{9}\right]$		1	1	
8.1.2	$\frac{4}{9}$		1	1	

8.2.1	Volume of a cone $= \frac{1}{3}\pi r^2 h$ Volume of a cone $= \frac{1}{3}\pi(20)^2 \text{ cm } 40 \text{ cm} = 16\,746,6 \text{ cm}^3$ 16755,16 $= 16\,746 \text{ cm}^3$ rounding $[\pi=16755\text{cm}^3]$	Substitution Simplification Rounding off	1	2		
8.2.2	Volume of a sphere $= \frac{4}{3}\pi(5) \text{ cm}^3 = 523,598\text{cm}^3 = 524 \text{ cm}^3$ OR 523 cm^3	Substitution Simplification Rounding off	1	2		
8.2.3	Space left in HOLDER $= 16\,755\text{cm}^3 - (9 \times 524\text{cm}^3) = 12\,039 \text{ cm}^3 (\pi)$ OR $12\,040 \text{ cm}^3 (3,14)$	Multiplying by 9 balls Mathematical operation of subtraction Simplification		1	2	
		Subtotal	4	7	2	
		FINAL TOTAL	74	69	7	
		ACTUAL %	49	46	5	
		EXPECTED % ACCORDING TO IEB SAG	50	40	10	