

**basic education**

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

ANNUAL NATIONAL ASSESSMENTS 2010**GRADE 9 MATHEMATICS - ENGLISH****FORM B****MEMORANDUM****Important Information**

- This is a marking guideline. In instances where learners have used different but mathematically sound strategies to solve the problems they (learners) should be credited.
- Unless stated otherwise, learners who give a correct answer only, should be awarded full marks.

QUESTION 1

1.	1.1	A	1.2	B	1.3	D	1.4	C	1.5	C	Give 1 mark for each correct answer.	[10]
	1.6	C	1.7	C	1.8	B	1.9	C	1.10	C		

QUESTION 2

2.1.1	$\begin{aligned} x^2 + 4x + 4 - x^2 + 2x + 3 & \checkmark\checkmark \\ = 6x + 7 & \checkmark \end{aligned}$	Distributive law: 2 marks Answer: 1 mark	(3)
2.1.2	$\frac{4y^2}{x} \checkmark\checkmark$	4: 1 mark y^2 : 1 mark x : 1 mark	(3)
2.1.3	$\begin{aligned} & \checkmark \quad \checkmark \quad \checkmark \quad \checkmark \\ 8x^2 + 4x - 1 - 4x + 1 \\ & = 8x \quad \checkmark \end{aligned}$	Simplifying each term of fraction: 3 marks expanding the bracket: 1 mark Answer: 1 mark	(5)
2.2.1	$\begin{aligned} & \checkmark \quad \checkmark \quad \checkmark \\ = 9a^2 - 6a - 3 \end{aligned}$	Each correct term: 1 mark	(3)
2.2.2	$\begin{aligned} a^3 - 2a^2 + 4a + 2a^2 - 4a + 8 & \checkmark \\ = a^3 + 8 & \checkmark\checkmark \end{aligned}$	Expanding: 2 marks Answer: 1 marks	(3)
2.3.1	$\begin{aligned} & \checkmark \quad \checkmark \\ 2xy(xy - 2x + 5y) \end{aligned}$	$2xy$: 1 mark $(xy - 2x + 5y)$: 1 mark	(2)
2.3.2	$\begin{aligned} & \checkmark \quad \checkmark \\ (3x + y)(3x - y) \end{aligned}$	Each correct bracket: 1 mark	(2)
2.3.3	$\begin{aligned} & \checkmark \quad \checkmark \quad \checkmark \\ 2x(x^2 - 4) = 2x(x + 2)(x - 2) \end{aligned}$	Common factor: 1 mark difference of two squares: 1 mark	(3)

2.4	$ \begin{array}{r l} 3 & 1089 \\ \hline 3 & 363 \\ \hline 11 & 121 \\ \hline 11 & 11 \\ \hline & 1 \end{array} $ $\sqrt{1089} = \sqrt{3^2 \cdot 11^2} = 3 \times 11 = 33$	<p>factorising correctly: 2 marks</p> <p>Answer: 2 marks</p>	(4)
-----	---	--	-----

2.5.1	$ \begin{aligned} 3x - 3 - 4x &= 5 - 2x - 2 && \checkmark \\ \therefore -x - 3 &= -2x + 3 && \checkmark \\ \therefore x &= 6 && \checkmark \end{aligned} $	<p>Expanding: 1 mark</p> <p>Simplifying x: 1 mark</p> <p>Answer = 6: 1 mark</p>	(3)
-------	--	--	-----

2.5.2	$ \begin{aligned} 2x - 3 &= 3x && \checkmark \\ \therefore x &= -3 && \checkmark \checkmark \end{aligned} $	<p>Multiply by 3: 1 mark</p> <p>Answer: 2 marks</p>	(3)
-------	--	---	-----

2.5.3	$ \begin{aligned} 3(x - 2) - 4(4x + 1) &= x - 2 && \checkmark \\ \therefore 3x - 6 - 4x - 4 &= x - 2 && \checkmark \\ -x - 10 &= x - 2 && \checkmark \checkmark \\ -8 &= 2x && \checkmark \\ \therefore x &= -4 \end{aligned} $	<p>Multiply by 12: 1 mark</p> <p>Simplifying correctly: 1 mark</p> <p>Further Simplifying: 2 marks</p> <p>Answer: 1 mark</p>	(5)
-------	---	--	-----

[39]

QUESTION 3

3.1	$ \begin{aligned} SI &= \frac{Pnr}{100} && \checkmark \\ &= \frac{(R5400)(4)(6)}{100} && \checkmark \\ &= R1296 && \checkmark \end{aligned} $	<p>Formula: 1 mark</p> <p>Substitution: 2 mark</p> <p>Answer: 1 mark</p>	(4)
-----	---	--	-----

3.2	$ \begin{aligned} A &= P \left(1 + \frac{r}{100} \right)^n && \checkmark \\ &= \frac{(R8000)(1,05)^3}{100} && \checkmark \checkmark \checkmark \\ &= R9261 && \checkmark \\ \text{Amount to be paid} &= R9\,261 \end{aligned} $	<p>Formula: 1 mark</p> <p>Substitution: 3 marks</p> <p>Answer: 1 mark</p>	(5)
3.3.1	<p>inverse proportion \checkmark</p>	<p>Answer: 1 mark</p>	(1)
3.3.2	<p>Let time taken = t hours</p> <p>Then $16t = 40$ hours \checkmark</p> <p>$\therefore t = 2,5$ or 2 hours 30 minutes \checkmark</p>	<p>Equation: 1 mark</p> <p>Answer: 1 mark</p>	(2)

3.4	Cost of 4,5 kg = R36 Cost of 1 kg: $R36 \div 4,5 = R8$ ✓ \therefore Cost 2,5 kg = $8 \times 2,5 = R20$ ✓ ✓ $\frac{4,5}{2,5} = \frac{36}{x}$ or $\Rightarrow 4,5x = 2,5 \times 36 = 20$	Work out cost of 1 kg: 1 mark Cost of 2,5 kg: 2 marks	(3)
-----	---	--	-----

[15]

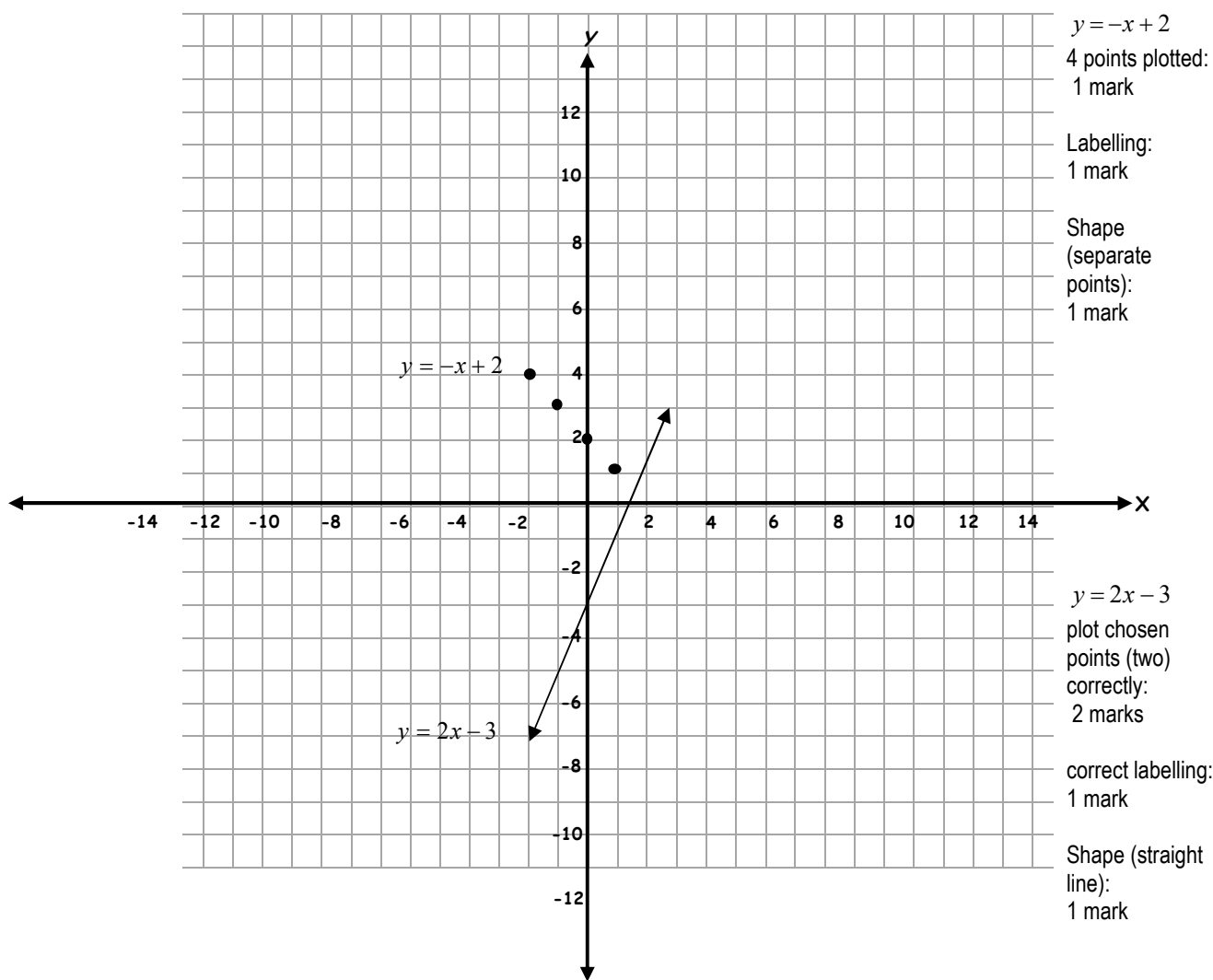
QUESTION 4

4.1	✓ ✓ 17; 21	Each term: 1 mark	(2)
4.2	✓ Add 4 to get to the next number.	Answer: 1 mark	(1)
4.3	✓ ✓ $4n + 1$	Answer : 1 mark	(2)
4.4	$4n + 1 = 101$ ✓ ✓ $4n = 100$ $n = 25$ ✓ ✓ Therefore $T_{25} = 101$	Equation: 2 marks Answer : 2 marks	(4)

[9]

QUESTION 5

5.1	5.1.1	c	5.1.2	a	1 mark each	(2)																		
5.2	<div>$y = 2 - x$</div> <table><tr><td>x</td><td>-2</td><td>-1</td><td>0</td><td>1</td></tr><tr><td>y</td><td>4</td><td>3</td><td>2</td><td>1</td></tr></table> <div>$y = 2x - 3$<div>Note: learners can choose other x-values in the table below.</div><table><tr><td>x</td><td>-1</td><td>0</td><td>1</td></tr><tr><td>y</td><td>-5</td><td>-3</td><td>-1</td></tr></table></div>				x	-2	-1	0	1	y	4	3	2	1	x	-1	0	1	y	-5	-3	-1		
x	-2	-1	0	1																				
y	4	3	2	1																				
x	-1	0	1																					
y	-5	-3	-1																					



(7)

[9]

QUESTION 6

6.1.1	\checkmark A parallelogram – both pairs of opposite sides equal \checkmark	parallelogram: 1 mark reason: 1 mark	(2)
6.1.2	Area trap. APCD = $\frac{(PC + AD)h}{2}$ $\checkmark\checkmark$ $= \frac{(16 + 24) \cdot 12}{2} \text{ cm}^2$ \checkmark $= 240 \text{ cm}^2$ \checkmark	Recognising APCD is a trapezium: 1 mark Formula: 1 mark Substitution: 1 mark Answer: 1 mark	(4)
6.1.3	Opposite sides of rectangle APTC	Answer: 1 mark	(1)
6.1.4	In $\triangle ABP$ and $\triangle CDT$ 1. $AP = TC$ (opp. sides of rect. APTC) \checkmark 2. $BP = TD = 8 \text{ cm}$ \checkmark 3. $\hat{P}_1 = \hat{T}_1 = 90^\circ$ \checkmark $\triangle ABP \equiv \triangle CDT$ (S, <, S) \checkmark	Correct statement: 1 mark Correct statement: 1 mark Correct statement: 1 mark Correct case: 1 mark	(4)
6.2	In $\triangle ABC$ $\hat{A}_1 + \hat{B} = 140^\circ$ (sum of \angle s of \triangle) $\checkmark\checkmark$ But $\hat{A}_1 = \hat{B} = 70^\circ$ (angles opp. equal sides of a \triangle) $\checkmark\checkmark$ $\hat{C}_2 = \hat{A}_1 = 70^\circ$ (Alt \angle s; $AB \parallel DC$) $\checkmark\checkmark$ $\hat{A}_2 = \hat{C}_1 = 40^\circ$ (Alt \angle s; $AD \parallel BC$) $\checkmark\checkmark$ $\therefore \hat{BAD} = 110^\circ$ \checkmark	Correct statement and reason: 2 marks Correct statement and reason: 2 marks Correct statement and reason: 2 marks Correct statement and reason: 2 marks Answer: 1 mark	(9)
6.3.1	$\triangle ABE$	Answer: 1 mark	(1)
6.3.2	$\frac{AB}{AC} = \frac{BE}{CD} = \frac{AE}{ED}$ (proportional sides of similar \triangle 's) $\checkmark\checkmark$ $\frac{9}{AC} = \frac{3}{8}$ \checkmark $AC = 24 \text{ cm}$ \checkmark $\therefore BC = 24 - 9$ $= 15 \text{ cm}$ $\checkmark\checkmark$	Proportional sides: 2 marks substitution: 1 mark $AC = 24$: 1 mark Answer: 2 marks	(6)
6.4.1	Volume = Area $\triangle ABC \times h$ \checkmark $= \frac{5(12)}{2} \times 20 \text{ m}^3$ \checkmark $= 600 \text{ m}^3$ \checkmark	formula: 1 mark substitution: 1 mark Answer: 1 mark	(3)

6.4.2	<p>In $\triangle ABC$: $BC^2 = 25 + 144 \text{ m}^2$ (Pythagoras.) $\checkmark\checkmark$ $= 169 \text{ m}^2$ \checkmark</p> <p>Therefore $BC = 13 \text{ m}$ \checkmark</p> <p>Surface Area = $2 \times \text{Area } \triangle ABC + (AB+AC+BC) \times AD$ $= 2 \times \frac{5(12)}{2} + (30)(20) \text{ m}^2$ $\checkmark\checkmark$ $= 60 + 600 \text{ m}^2$ $= 660 \text{ m}^2$ \checkmark</p>	<p>Using Pythagoras to get BC: 4 marks Formula: 1 mark</p> <p>Substitution: 2 marks</p> <p>Answer : 1 mark</p>	(8)
-------	---	---	-----

[38]

QUESTION 7

7.1	Stem	Leaf	Stem	Leaf		2 marks for each plot	
	3	8 1	3	1 8			
	4	5 7 9	4	5 7 9			
	5	2 2 5 8	5	2 2 5 8			
	6	8 4	6	4 8			
	7	4 2	7	2 4			
	8	1 4	8	1 4			(4)

7.2.1	Range = $84 - 31 = 53$ $\checkmark\checkmark$	Correct answer: 2 marks	(2)
7.2.2	Mode = 52 \checkmark	Correct answer: 1 mark	(1)
7.2.3	Median = 55 $\checkmark\checkmark$	Correct answer: 2 marks	(2)
7.2.4	Mean = $\frac{870}{15} = 58$ $\checkmark\checkmark\checkmark$	Correct answer: 3 marks	(3)
7.3	7 learners $\checkmark\checkmark$	Correct answer: 2 marks	(2)

[14]

QUESTION 8

8.1	$P(> 6) = \frac{2}{8} = \frac{1}{4}$ $\checkmark\checkmark$	Answer: 2 marks	(2)
8.2	$P(\text{prime number}) = \frac{4}{8} = \frac{1}{2}$ $\checkmark\checkmark$	Answer: 2 marks	(2)
8.3	$P(\text{a factor of 8}) = \frac{4}{8} = \frac{1}{2}$ $\checkmark\checkmark$	Answer: 2 marks	(2)

[6]

Total [140]