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MATHEMATICS: EXAMINATION

GRADE 9 · TERM 3 · SEPTEMBER 2025

Numeric Patterns · Algebra · Equations · Straight-Line Graphs · Geometry

TOTAL: 50 MARKS TIME: 1 HOUR

MEMORANDUM / MARKING GUIDELINE

One ✓ = one mark. Accept any other mathematically correct method.

QUESTION 1

1	Blank squares (T): 12 ; 14 ; 28 ✓ Crossed squares (C): 2 ; 4 ; 20 ✓ Dots (D): 24 ; 31 ; 80 ✓ $T_n = 2n$ ✓ + 8 ✓	✓ blank squares ✓ crossed squares ✓ dots ✓ $2n$ ✓ + 8	(5)
		TOTAL	**[5]**

QUESTION 2

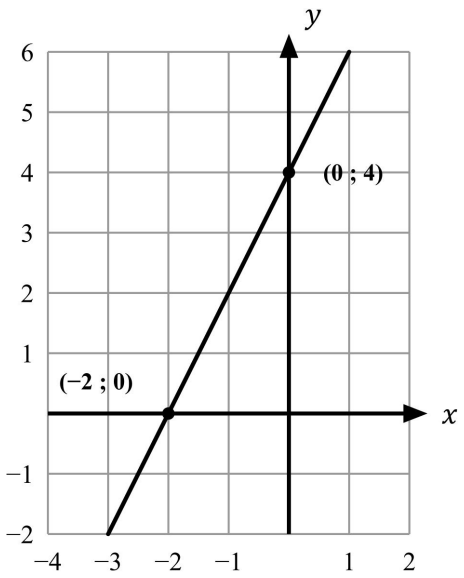
2.1.1	$2(a-b)^2 = 2(a^2 - 2ab + b^2)$ ✓ $= 2a^2 - 4ab + 2b^2$ ✓✓	✓ expanding $(a-b)^2$ ✓✓ $2a^2 - 4ab + 2b^2$	(3)
2.1.2	$\frac{x^2-9}{4} \div \frac{x+3}{2} = \frac{x^2-9}{4} \times \frac{2}{x+3}$ ✓ $= \frac{(x+3)(x-3)}{4} \times \frac{2}{x+3}$ ✓ $= \frac{x-3}{2}$ ✓✓	✓ multiplying by the reciprocal ✓ factorising $x^2 - 9$ ✓ numerator $x - 3$ ✓ denominator 2	(4)
2.2.1	$a(b+c) + d(b+c) = (b+c)$ ✓ $(a+d)$ ✓	✓ common factor $(b+c)$ ✓ $(a+d)$	(2)
2.2.2	$x^2 + 5x - 50 = (x+10)$ ✓ $(x-5)$ ✓	✓ $(x+10)$ ✓ $(x-5)$	(2)
		TOTAL	**[11]**

QUESTION 3

3.1	$3(x+1) = 2x + 3$ $3x + 3 = 2x + 3$ ✓ $3x - 2x = 3 - 3$ ✓ $x = 0$ ✓	✓ removing the brackets ✓ like terms together ✓ answer	(3)

3.2	$\frac{x-3}{3}=\frac{x-1}{4}$ $4(x-3)=3(x-1)$ ✓ $4x-12=3x-3$ ✓ $4x-3x=-3+12$ ✓ $x=9$ ✓	✓ multiplying by the LCD 12 (or cross-multiplying) ✓ removing the brackets ✓ like terms together ✓ answer	(4)
		TOTAL	**[7]**

QUESTION 4

4.1.1	x: −2 ; −1 ; 0 ; 1 ; 2 y: 0 ; 2 ; 4 ; 6 ; 8 ✓	✓ all five y-values	(1)
4.1.2	$m=2$ ✓	✓ answer	(1)
4.1.3	x-intercept: $0=2x+4$ ✓ $x=-2$, so (−2 ; 0) ✓ y-intercept: $y=2(0)+4$ ✓ $y=4$, so (0 ; 4) ✓	✓ $y=0$ ✓ x-intercept (−2 ; 0) ✓ $x=0$ ✓ y-intercept (0 ; 4)	(4)
4.1.4	 x-intercept at −2 ✓ y-intercept at 4 ✓ A straight line with a positive gradient ✓	✓ x-intercept ✓ y-intercept ✓ shape and direction	(3)
4.2.1	Decreasing ✓	✓ answer	(1)
4.2.2	$c=3$ (the y-intercept) ✓ $y=mx+3$; substitute (2 ; 0): $0=2m+3$ ✓ $m=-\frac{3}{2}$ $y=-\frac{3}{2}x+3$ ✓	✓ $c=3$ ✓ substituting (2 ; 0) ✓ equation	(3)
		TOTAL	**[13]**

QUESTION 5

5.1	$x = 45°$ ✓ (vertically opposite angles) ✓	✓ answer ✓ reason	(2)
5.2	$3x + 20° + 5x + 60° + 2x + 50° = 360°$ (angles around a point) ✓ $10x = 230°$ ✓ $x = 23°$ ✓	✓ equation with reason ✓ $10x = 230°$ ✓ answer	(3)
5.3.1	$\hat{Z}_1 = 110°$ ✓ (corresponding angles, WY // ZJ) ✓	✓ answer ✓ reason	(2)
5.3.2	$\hat{Z}_2 = 180° - 110° = 70°$ ✓ (angles on a straight line) ✓	✓ answer ✓ reason	(2)
5.3.3	$x = 180° - 70° - 50°$ (sum of the angles of a triangle) ✓ $x = 60°$ ✓	✓ statement with reason ✓ answer	(2)
		TOTAL	**[11]**

QUESTION 6

6.1	$2x + 36° = (x + 10°) + (3x - 50°)$ (exterior angle of a triangle) ✓ $2x + 36° = 4x - 40°$ $2x = 76°$ ✓ $x = 38°$ ✓	✓ equation with reason ✓ $2x = 76°$ ✓ answer	(3)
		TOTAL	**[3]**

TOTAL: 50