2nd Year Christmas Assessment

Marking scheme

Question 1

Marking scheme

(a) **10 marks** **Att 3**

I	II
$y=\sqrt{2x-a}$ $y=\sqrt{2(4)-(-1)}$ $y=\sqrt{8+1}$ $y=\sqrt{9}$ $y=3$	$y^2=2x-a$ $y^2=2(4)-(-1)$ $y^2=9$ $y=\pm 3$

Question 2

Marking scheme

(a) **10 marks** **Att 3**

$(2x-3)(4-5x)$
$2x(4-5x)-3(4-5x)$
$8x-10x^2-12+15x$
$-10x^2+23x-12$

Question 3

Marking scheme

(a) Factorise fully $9a^2-6ab+12ac-8bc$.

$$\begin{aligned} 9a^2-6ab+12ac-8bc &= 3a(3a-2b)+4c(3a-2b) \\ &= (3a-2b)(3a+4c). \end{aligned}$$

(b) Factorise $9x^2-16y^2$.

$$9x^2-16y^2 = (3x-4y)(3x+4y).$$

(c) Use factors to simplify the following: $\dfrac{2x^2+4x}{2x^2+x-6}$.

$$\begin{aligned} \frac{2x^2+4x}{2x^2+x-6} &= \frac{2x(x+2)}{(x+2)(2x-3)} \\ &= \frac{2x}{2x-3}. \end{aligned}$$

Question 4

Marking scheme

Q11	Model Solution – 15 marks	Marking Notes
(a)	$8x^2 - 13x$	**Scale 5C (0, 2, 3, 5)** *Low Partial Credit:* • Work of merit, for example, indicates a pair of "like" terms (two x^2 terms or two x terms) *High Partial Credit:* • 1 term in answer correct

Question 5

Marking scheme

(a) **10 marks** **Att 3**

I

$4 - x$ $\quad$ $2x - 5$

$4 + 5$ $\quad$ $2x + x$

9 $\quad$ $3x$

$9 \quad 3$ $\quad$ x

3 $\quad$ x $\quad$ **7m**

II

$4 - x$ $\quad$ $2x - 5$

$-x - 2x$ $\quad$ $-5 - 4$

$-3x$ $\quad$ -9

$3x$ $\quad$ 9

x $\quad$ $9 \div 3$

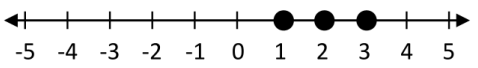
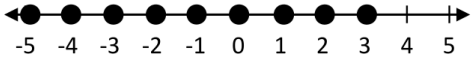
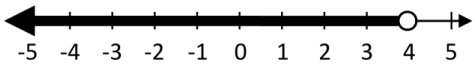
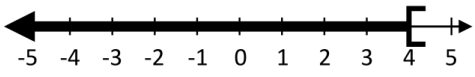
x $\quad$ 3 $\quad$ **7m**

$x \quad \leq \quad 3 \rightarrow \{1,2,3\}$ $\quad$ **7m**

10m

Question 6

Marking scheme

(b)	(i)  (ii)  (iii)  **OR**  	**Scale 5C (0, 2, 4, 5)** Accept 0 as an element in (i). Accept correct answer without work. *Low Partial Credit* • One graph correct *High Partial Credit* • Two graphs correct *Full Credit – 1* • 4 included in one or more solutions, otherwise all parts fully correct

Question 7

Marking scheme

Q9	Model Solution – 25 Marks	Marking Notes
(d)	$x = \frac{7 \pm \sqrt{7^2 - 4(2)(-3)}}{2(2)}$ $= \frac{7 \pm \sqrt{73}}{4} = 3{\cdot}886 \ldots$ or $-0{\cdot}386 \ldots$ $= 3{\cdot}89$ or $-0{\cdot}39$ [2 D.P.]	**Scale 5C (0, 2, 3, 5)** *Low Partial Credit* • Work of merit, for example, some substitution into correct formula • Identifies *a* or *b* or *c* • One correct answer without work *High Partial Credit* • Formula fully substituted correctly • One error in filling in formula, but evaluates correctly • $7 \pm \frac{\sqrt{73}}{4}$ and finishes correctly • Correct answers without work *Full Credit –1* • No rounding or incorrect rounding

Question 8

Marking scheme

(c) **(i)** Solve the simultaneous equations:

$$2x - 3y = 18 \quad ①$$
$$5x + 9y = -10 \quad ②$$

$① \times 3$: $6x - 9y = 54$

②: $5x + 9y = -10$

$11x = 44$

$\div 11$: $x = 4$

Sub in $x = 4$ in ①:

$2(4) - 3y = 18$

$8 - 3y = 18$

$-3y = 18 - 8$

$-3y = 10$

$\times(-1)$: $3y = -10$

$\div 3$: $y = -10 \div 3 = -10/3$ *or equivalent*

Answer: $x = 4$ and $y = -10/3$.

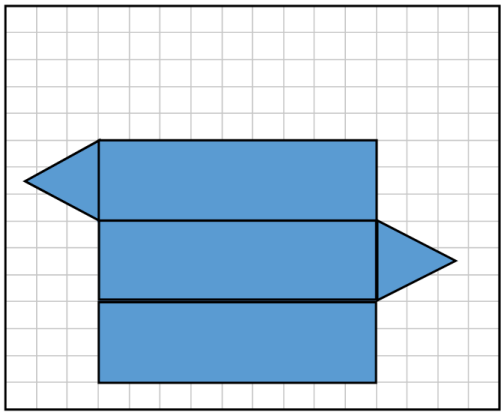
(ii) Verify your answer to **(c)(i)**.

*Note: Only need to check the equation that **wasn't** used to find the second variable. In this case, we only need use ②.*

$$5(4) + 9\left(-\frac{10}{3}\right) = 20 - 30 = -10.$$

Question 9

Marking scheme

Q6	Model Solution – 10 marks	Marking Notes
		**Scale 10C (0, 5, 7, 10)** 4 faces drawn are required Note: Accept correct construction without construction lines. Tolerance: The apex of the triangle is within the relevant 1 cm^2 square *Low Partial Credit:* • Work of merit, for example: rough sketch drawn • 1 face correctly drawn *High Partial Credit:* • 3 faces correctly drawn • All faces drawn but scale incorrect. • All faces to scale but triangles on wrong face

Question 10

Marking scheme

Q13	Model Solution – 10 marks	Marking Notes
(a) **(b)**	**(a)** $w = 12 + 2x$ **(b)** $l \times w = (18 + 2x)(12 + 2x)$ $= 216 + 36x + 24x + 4x^2$ $= 4x^2 + 60x + 216$	**Scale 5D (0, 2, 3, 4, 5)** *Low Partial Credit:* • Work of merit in **(a)**, for example, writes w as $12 - 2x$ or $12 + x$ • Work of merit in **(b)**, for example, fills in correctly for l or w in $l \times w$ *Mid Partial Credit:* • Work of merit in both **(a)** and **(b)** • **(a)** not correct, but significant work of merit in **(b)**, for example, 3 of the 4 terms in $l \times w$ fully multiplied out *High Partial Credit:* • **(a)** correct **and** significant work of merit in **(b)**, for example, 3 of the 4 terms in $216 + 36x + 24x + 4x^2$ correct • **(a)** not correct, but $l \times w$ fully multiplied out and simplified for candidate's own value of w *Full Credit –1:* • $216 + 36x + 24x + 4x^2$ but no conclusion. (In the model solution, "$216 + 60x + 4x^2$" is considered as an appropriate conclusion.)