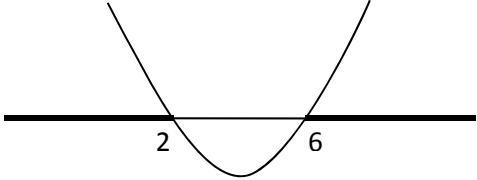
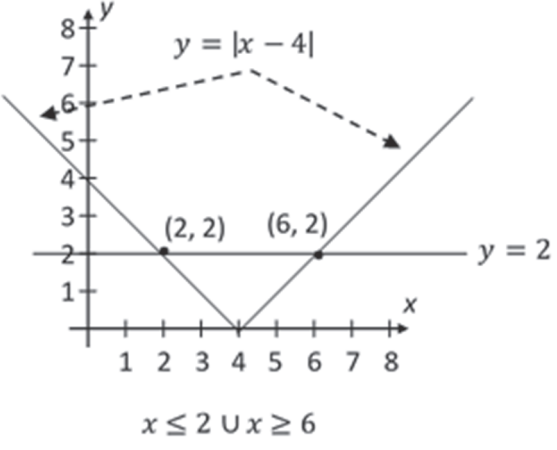


Question 2**(25 marks)**

(a) Find the range of values of x for which $|x - 4| \geq 2$, where $x \in \mathbb{R}$.

(b) Solve the simultaneous equations:

$$\begin{aligned}x^2 + xy + 2y^2 &= 4 \\2x + 3y &= -1.\end{aligned}$$

Q2	Model Solution – 25 Marks	Marking Notes
(a)	$x^2 - 8x + 16 \geq 4$ $x^2 - 8x + 12 \geq 0$ $(x - 2)(x - 6) \geq 0$ $x = 2 \quad x = 6$ $\{x x \leq 2\} \cup \{x x \geq 6\}$ <p style="text-align: center;">Or</p> $x - 4 \geq 2 \cup x - 4 \leq -2$ $x \geq 6 \cup x \leq 2$ <p style="text-align: center;">Or</p> <p>Graphical method (must indicate range on X-axis somehow)</p>  <p style="text-align: center;">Or</p>  $x \leq 2 \cup x \geq 6$	<p>Scale 10C (0, 3, 7, 10)</p> <p><i>Low Partial Credit:</i></p> <ul style="list-style-type: none"> • either side squared • one correct linear inequality written • stating range of natural numbers only <p><i>High Partial Credit:</i></p> <ul style="list-style-type: none"> • correct solutions to quadratic <p><i>Full Credit:</i></p> <ul style="list-style-type: none"> • correct answer without work <p>Note: use of natural numbers in range merits <i>High Partial Credit at most</i></p> <p style="text-align: center;">Or</p> <p>Scale 10C (0, 3, 7, 10)</p> <p><i>Low Partial Credit:</i></p> <ul style="list-style-type: none"> • any one straight line <p><i>High Partial Credit:</i></p> <ul style="list-style-type: none"> • three straight lines

(b)

$$x = \frac{-3y - 1}{2}$$
$$\left(\frac{-3y - 1}{2}\right)^2 + \left(\frac{-3y - 1}{2}\right)(y) + 2y^2 = 4$$
$$11y^2 + 4y - 15 = 0$$
$$(11y + 15)(y - 1) = 0$$
$$y = \frac{-15}{11} \text{ or } y = 1$$
$$x = \frac{-3\left(\frac{-15}{11}\right) - 1}{2} \text{ or } x = \frac{-3(1) - 1}{2}$$
$$x = \frac{17}{11} \text{ or } x = -2$$

or

$$y = \frac{-2x - 1}{3}$$
$$x^2 + x\left(\frac{-2x - 1}{3}\right) + 2\left(\frac{-2x - 1}{3}\right)^2 = 4$$
$$11x^2 + 5x - 34 = 0$$
$$(11x - 17)(x + 2) = 0$$
$$x = \frac{17}{11} \text{ or } x = -2$$
$$y = \frac{-15}{11} \text{ or } y = 1$$

Scale 15C (0, 5, 10, 15)

Low Partial Credit:

- effort to isolate x (or y)

High Partial Credit:

- fully correct substitution into quadratic