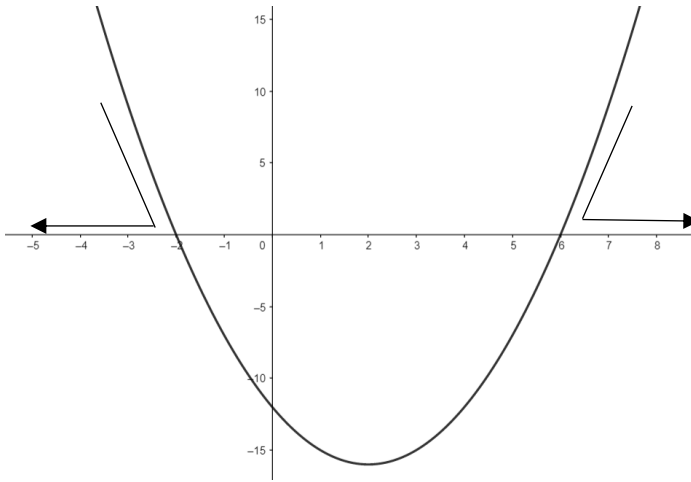


Q3	Model Solution – 25 Marks	Marking Notes
(a) (i)	$y = 1 - 2x \quad (\text{Rearranging the first equation})$ $x^2 - 4k(1 - 2x) + 5k = 0$ <p style="text-align: center;">(Subbing linear equation into quadratic equation)</p> $x^2 - 4k + 8kx + 5k = 0$ <p style="text-align: right;">(Expanding brackets)</p> $x^2 + 8kx + k = 0 \quad (\text{Simplify})$	<p>MS (0, 2, 3, 5)</p> <p>LPC: Rearranging the first equation</p> <p>HPC: Subbing linear equation into quadratic equation</p>
(ii)	$b^2 - 4ac = 0 \quad (\text{equal roots} \rightarrow b^2 - 4ac = 0)$ $a = 1, b = 8k, c = k$ $(8k)^2 - 4(1)(k) = 0$ $64k^2 - 4k = 0$ $4k(16k - 1) = 0$ $k = 0 \text{ or } k = \frac{1}{16}$ <p style="text-align: center;">k is a non zero constant so $k = \frac{1}{16}$</p>	<p>MS (0, 3, 4, 5)</p> <p>LPC: $b^2 - 4ac = 0$ with some correct substitution</p> <p>HPC: Fully correct with one mistake</p>
(iii)	$2x + y = 1$ $y = 1 - 2x$ $x^2 - \frac{y}{4} + \frac{5}{16} = 0$ $16x^2 - 4y + 5 = 0 \quad (\times \text{ by } 16 \text{ to remove fractions})$ $16x^2 - 4(1 - 2x) + 5 = 0 \quad (\text{sub in above eq})$ $16x^2 - 4 + 8x + 5 = 0$ $16x^2 + 8x + 1 = 0$ $(4x + 1)(4x + 1) = 0$ $x = -\frac{1}{4}$ $y = 1 - 2x \quad (\text{sub in answer for } x)$ $y = \frac{3}{2}$	<p>MS (0, 2, 3, 4, 5)</p> <p>LPC: follow through substitution OR any substitution</p> <p>MPC: Correct substitution leading to an equation in x or y only</p> <p>HPC: correct x/y</p>

(b)

$$\begin{aligned}x(x - 4) &> 12 \\x^2 - 4x - 12 &> 0 \\(x - 6)(x + 2) &> 0 \\x = 6, x = -2\end{aligned}$$



$$\begin{aligned}x < -2, x > 6 \\ \text{OR} \\ -2 > x > 6\end{aligned}$$

MS (0, 5, 8, 10)

LPC: Correct quadratic with an attempt to solve

HPC: Correct x values

FC: Correct solutions

** $x \leq -2, x \geq 6$ 9 marks **