

Q2	Model Solution – 25 Marks	Marking Notes
(a)	$x^2 + y^2 + 2gx + 2fy + c = 0$ $x^2 + y^2 - 6x + 4y = 12$ $2g = -6 \quad 2f = 4$ $-g = 3 \quad -f = 2$ <p style="text-align: center;">Centre: (3, -2)</p> $\text{Radius} = \sqrt{g^2 + f^2 - c}$ $= \sqrt{3^2 + (-2)^2 - (-12)}$ $= \sqrt{25} = 5$ $(x - 3)^2 - 9 + (y + 2)^2 - 4 = 12$ $(x - 3)^2 + (y + 2)^2 = 12 + 9 + 4$ <p style="text-align: center;">Centre: (3, -2)</p> $r = \sqrt{25} = 5$	<p>MS (0, 3, 5)</p> <p>PC: Either centre or radius correct or work of merit for both</p>
(b)	$PQ = \sqrt{(7 - -1)^2 + (-5 - 1)^2}$ $PQ = \sqrt{(8)^2 + (6)^2}$ $PQ = 10 = 2 \times \text{radius} \therefore \text{diameter}$ <p style="text-align: center;">OR</p> $MP \text{ of } PQ = \left( \frac{7 + -1}{2} \right), \left( \frac{1 + -5}{2} \right) = (3, -2)$	<p>MS (0, 4, 8,10)</p> <p>LPC: Work of merit</p> <p>HPC: Correct answer without conclusion (e.g.  PQ =10 and stops)</p>
(c)	<p>R lies on C (angle on semi circle theorem)</p> $x = 0 \Rightarrow y^2 + 4y - 12 = 0$ $(y - 2)(y + 6) = 0$ $y = -6 \text{ or } y = 2$ <p style="text-align: center;">Correct answer (0,2)</p>	<p>MS (0, 4, 6, 8, 10)</p> <p>LPC: Work of merit to find answer eg marking R on the diagram</p> <p>MPC: Substitution of 0</p> <p>HPC: Correct equation in y</p>