1)

10 **(i)** $m_{AB} = \frac{1}{5}$ — B1

Use $m_1 m_2 = -1$ in equation for BC [$y - 5 = -5(x - 6)$ or $5x + y = 35$] — M1

C (7,0) — A1

Use $m_{CD} = m_{AB}$ and point C in equation of line — M1

CD: $y(-0) = \frac{1}{5}(x - 7)$ or $x - 5y = 7$ — A1

(ii) At D $x = 1$ — M1

At D $y = -1.2$ — A1

Method for area not involving measuring — M1

28.6 — A1

[9]

2)

Grad of $AB = -2$, perp grad $= \frac{1}{2}$ — B1M1 — B1 for grad AB; M1 use of $m_1 m_2 = -1$

Eqn of perp $y - 15 = \frac{1}{2}(x + 2)$ — M1 — M1 for correct attempt to find the equation of AC and hence to find C

$C(0, 16)$ — A1

Area $= \frac{1}{2}\sqrt{125}\sqrt{5}$ — M1 — M1 for a valid method to find area

$= 12.5$ — A1

(or $\frac{1}{2}\begin{vmatrix} -2 & 3 & 0 & -2 \\ 15 & 5 & 16 & 15 \end{vmatrix} = \frac{1}{2}(38 - 13)$) [6]

3)

Eliminates y (or x) — M1

$x^2 + 3x - 10 = 0$ (or $y^2 + 27y + 72 = 0$) oe — A1

Factorises 3 term quadratic or solves using formula — M1

$x = -5$ and 2 (or $y = -24$ and -3) — A1

$y = -24$ and -3 (or $x = -5$ and 2) — A1√

Uses Pythagoras — M1

22.1 or $\sqrt{490}$ or $7\sqrt{10}$ — A1 [7]

4)

$(2y + 1)^2 + y^2 = 29$ — M1 — M1 for attempt to get an equation in terms of one variable only

(or $5x^2 - 2x - 115 = 0$)

leading to $5y^2 + 4y - 28 = 0$ — DM1 — DM1 for obtaining a 3 term quadratic equation

(or $x^2 + \left(\frac{x-1}{2}\right)^2 = 29$) — DM1 — DM1 for attempt to solve quadratic equation

$x = -\frac{23}{5}, y = -\frac{14}{5}$ and — A1 — A1 for a pair of values

$x = 5, y = 2$ — A1

(5, 2) spotted gets B1 — **[5]**

5)

B (6, 4)	B1	
grad $AM = \frac{1}{5}$ $\therefore$ grad $BC = -5$	M1	M1 for attempt at gradient of BC
BC equation: $y - 4 = -5(x - 6)$	M1 A1	M1 for attempt at straight line equation A1 for correct equation in any form
When $y = 0$, $x = 6.8$	√B1	Ft on their BC equation
Area = 20.8	M1,A1 [7]	M1 for a correct method for area of triangle

6)

(i) P (3, 1)		**B1, B1**	**B1** for each coordinate
Grad $AB = \frac{18}{12}$		**B1**	**B1** for gradient of AB
$\perp$ grad $-\frac{2}{3}$		√**B1**	√**B1** for perpendicular gradient
PQ: $y - 1 = -\frac{2}{3}(x - 3)$	$(2x + 3y = 9)$	√**B1**	√**B1** on their perp gradient and their point P Must be $y = \ldots$
(ii) Q (–15, 13)		**M1** **A1**	**M1** for use of $y = 13$ and their PQ equation. **A1** for both coordinates (can be implied)
(iii) Area = $\frac{1}{2}\sqrt{18^2 + 12^2}\ \sqrt{8^2 + 12^2}$		**M1**	**M1** for a valid attempt at area $\frac{1}{2} \times PQ \times PB$
or Area = $\frac{1}{2}\begin{vmatrix} 3 & 11 & -15 & 3 \\ 1 & 13 & 13 & 1 \end{vmatrix}$			Matrix method using their coordinates correctly
or Area = $\frac{1}{2} \times 26 \times 12$ = 156		**A1**	$\frac{1}{2} \times QB \times$ vertical perp height
		[9]	

7)

$m_{CB} = \frac{1}{2}$	**B1**
(AD) $y - 4 = \frac{1}{2}(x - 11)$ or $x - 2y = 3$	**M1 A1**
Uses $m_1 m_2 = -1$	**M1**
(CD) $y - 2 = -2(x + 3)$ or $2x + y = -4$	**A1**
Solves equation AD with equation CD $D(-1, -2)$	**M1** **A1**
Completely correct method for area 55	**M1** **A1**
	[9]