Question	Scheme	Marks
9(a)	$\frac{y-8}{8-3}=\frac{x-6}{6--4}\Rightarrow\frac{y-8}{5}=\frac{x-6}{10}\Rightarrow\left[y-8=\frac{1}{2}(x-6)\right]$	M1A1 [2]
(b)	$C=\left(\frac{4\times6+1\times-4}{4+1},\frac{4\times8+1\times3}{4+1}\right)=(4,7)$	B1,B1 [2]
(c)	$-2=\frac{q-7}{p-4}\Rightarrow q=15-2p$ $8\sqrt{5}=\sqrt{(4-p)^2+(7-q)^2}$ $\Rightarrow 320=(4-p)^2+(2p-8)^2\Rightarrow p^2-8p-48=0$ $\Rightarrow(p+4)(p-12)=0$ $\Rightarrow p=-4\quad q=15-2\times-4=23\Rightarrow D=(-4,23)$	M1 M1 M1 M1 A1A1 [6]
(d)	Area of triangle $ACD=\frac{1}{2}\times(23-3)\times(4--4)=80$ [square units] **ALT 1** $\frac{1}{2}\begin{bmatrix}-4 & 4 & -4 & -4\\ 3 & 7 & 23 & 3\end{bmatrix}=\frac{1}{2}\left[(-28+92-12)-(12-28-92)\right]=80$ **ALT 2** $A=\frac{1}{2}\times AC\times CD=\frac{1}{2}\times4\sqrt{5}\times8\sqrt{5}=80$	M1A1 [2] [M1A1] [M1A1]
		Total 12 marks

Part	Mark	Notes
(a)	M1	For a **complete** method to find an equation of the line segment AB They must either use the formula shown Award M1A1 for $\frac{y-8}{5}=\frac{x-6}{10}$ (the denominators must be processed). OR They must find the gradient using a correct method and then use the formula $y-y_1=m(x-x_1)\Rightarrow y-8='\frac{1}{2}'(x-6)$ or using $(-4,3)$ OR They must find the gradient using a correct method and then using $y=mx+c$ they must find c and **put an equation together** to score this mark. $y='\frac{1}{2}'x+'5'$ Allow for example $k=\frac{1}{2}x+5$ for this mark (M1) only.
	A1	For a correct equation in any form.[See above]

(b)	B1	For either correct coordinate of C (4, 7) **This is an M mark in Epen**
	B1	For both correct coordinates of C (4, 7) **This is an M mark in Epen**
(c)	**Note:** You must ft their coords of C in part (c)	
	M1	For using the perpendicular gradient of their equation in (a) to set up a correct equation in terms of p and q **OR** For finding the equation of the line CD using their point C (4, 7) The method must be complete for this mark. $\frac{y-7}{7-23}=\frac{x-4}{4--4}\Rightarrow y=-2x+15$
	M1	For using the given length of CD to set up a second equation using Pythagoras theorem in terms of p and q $8\sqrt{5}=\sqrt{(4-p)^2+(7-q)^2}$ oe
	M1	For combining their two equations in p and q to obtain a 3TQ
	M1	For solving their 3TQ (provided it is a 3TQ) by any acceptable method. If the 3TQ is incorrect, there must be evidence of a method to score this mark. If they use their calculator on a correct 3TQ and obtain the correct values, score M1.
	A1	For the correct value of p or q
	A1	For the correct values of both p and q
(d)	M1	For any correct method to find the area of triangle ACD, using their coordinates. If they use the determinant method, check their work carefully.
	A1	For the correct area of 80 [square units].

Useful sketch