Question Number	Scheme	Marks
4. (a)	Area $ABCD$ is 40 cm^2 $\Rightarrow 40 = 6\times 10\times \sin\theta$ oe	M1
	$\sin\theta = \frac{2}{3} \Rightarrow \theta = 180° - 41.8°$	M1
	$\angle DAB =$ awrt $138.19°$	A1
		(3)
(b)	Attempts $DB^2 = 10^2 + 6^2 - 2\times 10\times 6\cos"138.19°"$	M1
	$DB =$ awrt 15.0 (cm)	A1
		(2)
		(5 marks)

(a)

M1 Scored for a correct attempt at using the area of $ABCD$ is 40 cm^2

Score for $40 = 6\times 10\times \sin\theta$ or $20 = \frac{1}{2}\times 6\times 10\times \sin\theta$ where θ is one of the corner angles.

M1 Score for $\sin\theta = k \Rightarrow \theta = 180° - \arcsin k$

A1 $\angle DAB =$ awrt $138.19°$

(b)

M1 Attempts $DB^2 = 10^2 + 6^2 - 2\times 10\times 6\cos"138.19°"$ - allow if the angle used is acute as long as it is clearly their attempt at angle DAB. So allow use of $41.8°$ unless they have correctly found angle DAB and chosen the wrong one here.

A1 $DB =$ awrt 15.0 (cm) Accept 15 in place of 15.0. Allow from attempts using awrt 138°

……

Alt for (a)

M1 Area $ABCD$ is 40 cm^2 $\Rightarrow h = \frac{40}{10} = ... \Rightarrow \sin\angle ABC = \frac{"4"}{6}$ OR $\cos\angle ABC = \frac{"4"}{6}$ oe

Essentially this mark is for using the area together with an appropriate trig identity to form an equation in the sine or cosine of one of the angles of the parallelogram. Attempts finding "DX" where X is where the perpendicular to DC through A meets DC are possible.

M1 $\angle DAB = 180° - \arcsin\left(\frac{"4"}{6}\right) = ...$ or may see $\angle DAB = 90° + \arccos\left(\frac{"4"}{6}\right) = ...$

This is for a complete correct method to find the angle DAB

A1 $\theta =$ awrt $138.19°$

Question Number	Scheme	Marks
5.(a)	$\frac{dy}{dx} = \frac{1}{2}x^2 + 2x^{-\frac{1}{2}}$	M1A1 A1 **(3)**
(b)	$\left.\frac{dy}{dx}\right\|_{x=4} = \frac{1}{2}\times 4^2 + 2\times\frac{1}{\sqrt{4}} = (9)$	M1
	Gradient of normal is $-\frac{1}{9}$	dM1
	$y - \frac{11}{3} = -\frac{1}{9}(x-4) \Rightarrow x + 9y - 37 = 0$	M1 A1 **(4)** **(7 marks)**

(a)

M1 For reducing the power by one on any x term

A1 Two correct terms which may be unsimplified (but ignore spurious extra terms like −15 for this mark)

A1 Fully correct and simplified. Accept exact simplified equivalents. Eg $\frac{x^2}{2} + \frac{2}{\sqrt{x}}$

Withhold the final A mark if "+c" is included.

(b)

M1 For substituting $x = 4$ into their $\frac{dy}{dx}$

dM1 For the correct method of using the negative reciprocal to find the gradient of the normal.

M1 For an attempt at finding the equation of the normal. It is for using a changed gradient and the point $\left(4, \frac{11}{3}\right)$ If the form $y = mx + c$ is used they must proceed to c = ...

A1 $x + 9y - 37 = 0$ or any (positive or negative) integer multiple thereof.

Accept with terms in a different order, but must include "=0". ISW after a correct answer.