

17th April



Corbettmaths

Simplify

$$\frac{\sqrt{700} - \sqrt{28}}{\sqrt{112}}$$

$$\frac{10\sqrt{7} - 2\sqrt{7}}{4\sqrt{7}}$$

$$= \frac{8\sqrt{7}}{4\sqrt{7}} = 2\sqrt{7}$$

Solve the simultaneous equations

$$\begin{aligned} x^2 + y^2 &= 13 & y &= 1 - x \\ x + y &= 1 & x^2 + (1-x)^2 &= 13 \\ & & x^2 + 1 - 2x + x^2 &= 13 \\ & & 2x^2 - 2x - 12 &= 0 \end{aligned}$$

$$\begin{aligned} x^2 - x - 6 &= 0 \\ (x-3)(x+2) &= 0 \\ x &= 3 & \text{or } x &= -2 \\ y &= -2 & & y &= 3 \end{aligned}$$

AB is a diameter of a circle C.
Q is the centre of the circle
A has coordinates $(-7, 1)$ and B has coordinates $(1, 7)$

$$\frac{-6}{2} = -3$$

$$\frac{8}{2} = 4$$

Find the centre of the circle, Q.

$$(-3, 4)$$

Find the equation of the tangent to C at the point B

$$\frac{3}{4} \rightarrow -\frac{4}{3}$$

$$y = -\frac{4}{3}x + c$$

$$7 = -\frac{4}{3} + c$$

$$c = \frac{25}{3}$$

$$y = -\frac{4}{3}x + \frac{25}{3}$$

P is a point on the curve $y = x^2 - 7x$
 $x=4$ $y=-12$
The tangent to the curve at P has gradient 1.

Work out the coordinates of P.

$$\frac{dy}{dx} = 2x - 7$$

$$1 = 2x - 7$$

$$2x = 8$$

$$x = 4 \quad y = -12$$

$$(4, -12)$$