

8th January



Corbettmaths

Solve the simultaneous equations

$$\begin{aligned} x^2 + y^2 &= 9 \\ y &= x + 3 \end{aligned}$$

$$\begin{aligned} x^2 + (x+3)^2 &= 9 \\ x^2 + x^2 + 6x + 9 &= 9 \\ 2x^2 + 6x &= 0 \\ x^2 + 3x &= 0 \end{aligned}$$

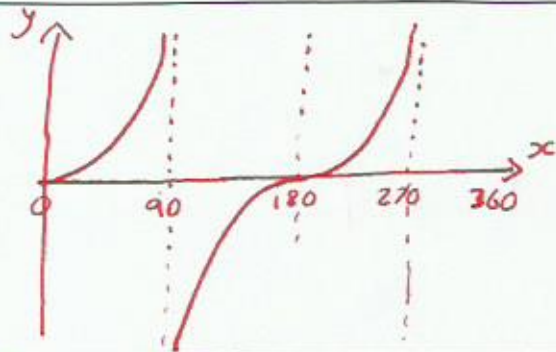
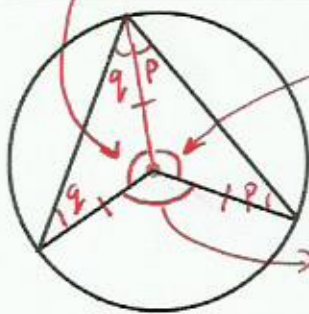
$$\begin{aligned} \rightarrow x(x+3) &= 0 \\ x &= 0 \text{ or } x = -3 \\ y &= 3 \text{ or } y = 0 \end{aligned}$$

Find the coordinates where $y = 2x^2 - 7x + 3$ crosses each axis.

crosses y-axis at $x=0$ $(0, 3)$
 $\therefore y = 3$

crosses x-axis at $y=0$
 $\Rightarrow 0 = 2x^2 - 7x + 3$

$$\begin{aligned} \rightarrow (2x-1)(x-3) &= 0 \\ 2x-1=0 \quad x-3=0 \\ x &= \frac{1}{2} \quad x=3 \\ \therefore \left(\frac{1}{2}, 0\right) \text{ and } (3, 0) \end{aligned}$$

Sketch $y = \tan x$ for $0 \leq x \leq 360$  $180 - 2q$  $180 - 2p$ $360 - (180 - 2p) - (180 - 2q)$

Prove that the angle at the centre is twice the angle at the circumference.

$$\begin{aligned} \rightarrow &= 360 - 180 + 2p - 180 + 2q \\ &= 2p + 2q \\ &= 2(p+q) \quad \text{Q.E.D.} \end{aligned}$$

Given that

$$125^x = 25^{x+5}$$

Find x $(5^3)^x = (5^2)^{x+5}$

$$\begin{aligned} \rightarrow 5^{3x} &= 5^{2x+10} \\ 3x &= 2x + 10 \\ x &= 10 \end{aligned}$$