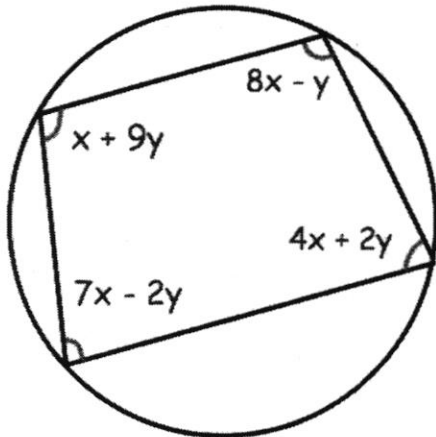


12th August



Corbettmaths

Shown is a cyclic quadrilateral

Find the values of  $x$  and  $y$ 

$$\begin{aligned} 5x + 11y &= 180 \quad (1) \\ 15x - 3y &= 180 \quad (2) \\ \hline 15x + 33y &= 540 \\ 36y &= 360 \\ \Rightarrow y &= 10 \\ \hline x &= 14 \end{aligned}$$

For what values of  $x$  is  
 $y = x^2 + 8x + 12$  a decreasing  
 function?

$$\begin{aligned} \frac{dy}{dx} &= 2x + 8 \\ 2x + 8 < 0 &\Rightarrow \underline{x < -4} \end{aligned}$$

Use factor theorem to show that  
 $(x - 5)$  is a factor of  $x^3 + x^2 - 30x$

$$\begin{aligned} f(x) &= x^3 + x^2 - 30x \\ f(5) &= 125 + 25 - 150 = 0 \\ &\Rightarrow \underline{x - 5 \text{ factor}} \end{aligned}$$

Solve

$$\sqrt{5} \cos x = \sin x$$

$$0^\circ \leq x \leq 360^\circ$$

$$\begin{aligned} \sqrt{5} &= \tan x \\ x &= \underline{65.9^\circ, 245.9^\circ} \end{aligned}$$