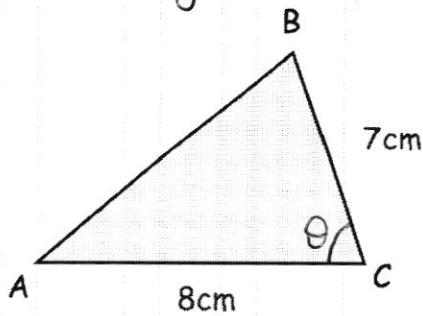


13th August



Corbettmaths

The area of the triangle $14\sqrt{3}$ cm²

Find the size of angle ACB

$$\begin{aligned} \text{Area} &= \frac{1}{2} ab \sin C \\ &= \frac{1}{2} \times 7 \times 8 \times \sin \theta = 14\sqrt{3} \\ \Rightarrow 28 \sin \theta &= 14\sqrt{3} \\ \Rightarrow \sin \theta &= \frac{14\sqrt{3}}{28} = \frac{\sqrt{3}}{2} \\ \Rightarrow \angle ACB &= 60^\circ \end{aligned}$$

$$\mathbf{B} = \begin{pmatrix} 4 \\ 3 \end{pmatrix}$$

Given $k\mathbf{B} = \begin{pmatrix} 2k+15 \\ k+15 \end{pmatrix}$ where k is a constant, work out the value of k

$$k\mathbf{B} \parallel \mathbf{B}$$

$$\begin{aligned} \frac{2k+15}{k+15} &= \frac{4}{3} \\ \Rightarrow 6k+45 &= 4k+60 \\ \Rightarrow 2k &= 15 \\ \Rightarrow k &= 7.5 \end{aligned}$$

$$y = ax^3 - x^2$$

Given $\frac{d^2y}{dx^2} = -23$ when $x = -\frac{1}{2}$

Find the value of a

$$\begin{aligned} \frac{dy}{dx} &= 3ax^2 - 2x \\ \frac{d^2y}{dx^2} &= 6ax - 2 \\ x = -\frac{1}{2} &\Rightarrow -3a - 2 = -23 \\ \Rightarrow 21 &= 3a \\ \Rightarrow a &= 7 \end{aligned}$$