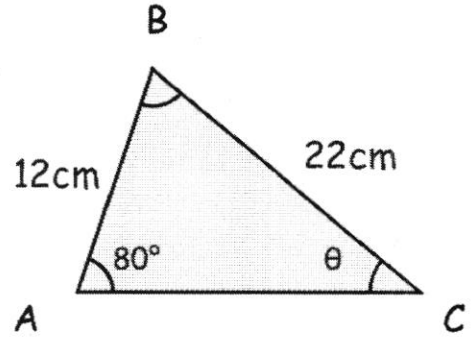
Name: _____ 5-a-day Further Maths

4th December

Corbettmaths



Find the size of angle BCA.

$\frac{\sin\theta}{12} = \frac{\sin 80^\circ}{22}$

$\sin\theta = 0.5372$

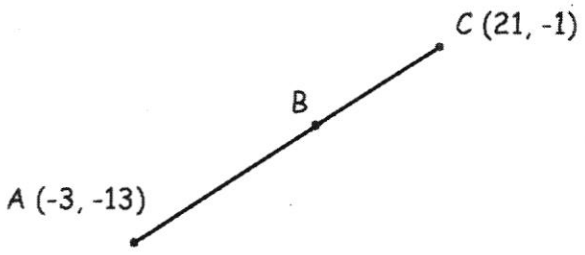
$\theta = 32.5^\circ$

$y = x^2(6x - 5)$

Work out $\frac{dy}{dx}$

$y = 6x^3 - 5x^2$

$\frac{dy}{dx} = 18x^2 - 10x$



ABC is a straight line.
AB is 40% longer than BC. AB : BC = 7 : 5

Work out the coordinates of B.

$\overrightarrow{AC} = \begin{pmatrix} 24 \\ 12 \end{pmatrix}$ $\overrightarrow{AB} = \frac{7}{12}\overrightarrow{AC} = \begin{pmatrix} 14 \\ 7 \end{pmatrix}$

$\overrightarrow{OB} = \begin{pmatrix} -3 \\ -13 \end{pmatrix} + \begin{pmatrix} 14 \\ 7 \end{pmatrix} = \begin{pmatrix} 11 \\ -6 \end{pmatrix}$ B(11, −6)

Factorise $7x^2 + 20xy - 3y^2$

$= 7x^2 + 21xy - xy - 3y^2$

$= 7x(x + 3y) - y(x + 3y)$

$= (x + 3y)(7x - y)$

A curve has equation $y = 2x^3 - x$

Find the gradient of the normal to the curve at the point $(-1, -1)$

$\frac{dy}{dx} = 6x^2 - 1$

$x = -1 \Rightarrow \frac{dy}{dx} = 5$

$\Rightarrow m_\perp = -\frac{1}{5}$