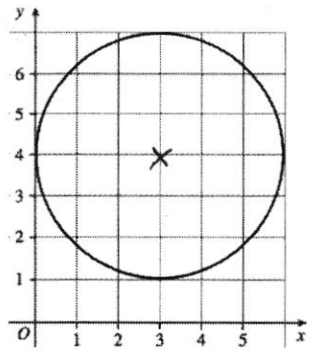
Name: ______________ 5-a-day Further Maths

7th June

Corbettmaths

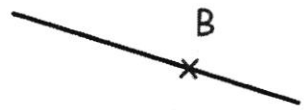


Find the equation of the circle.

Centre $(3,4)$, $r=3$

$(x-3)^2+(y-4)^2=9$

ABC is a straight line with
AB:BC = 5:2



Work out the coordinates of B.

$\overrightarrow{AC}=\begin{pmatrix}56\\-21\end{pmatrix}$

$\overrightarrow{AB}=\frac{5}{7}\overrightarrow{AC}=\begin{pmatrix}40\\-15\end{pmatrix}$

$\overrightarrow{OB}=\begin{pmatrix}-11\\40\end{pmatrix}+\begin{pmatrix}40\\-15\end{pmatrix}=\begin{pmatrix}29\\25\end{pmatrix}$

B $(29, 25)$

A curve has equation $y = x^2 - 6x$

Find the gradient of the normal to the curve at the point $(1, -5)$

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

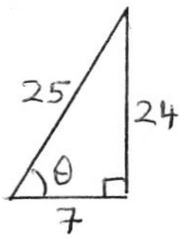
$x=1 \Rightarrow \frac{dy}{dx}=-4$

$\Rightarrow m_{\perp}=\frac{1}{4}$

Given $tan\theta = -\frac{24}{7}$ and θ is reflex

Work out the value of $cos\theta$

$\Rightarrow 270^\circ<\theta<360^\circ \Rightarrow \cos\theta>0$



$\cos\theta=\frac{7}{25}$

Given $2^{89} - 1$ is prime.

Show that $2^{89} + 1$ is a multiple of 3

$2^{89}-1$, 2^{89}, $2^{89}+1$
consecutive integers, one of which must be a multiple of 3.
$2^{89}-1$ is prime and the only prime factor of 2^{89} is 2.