Name: _____ 5-a-day Further Maths

20th August

Corbettmaths

Solve

$$\frac{216^x}{6^{x-5}} = 36\sqrt{6}$$

$\frac{6^{3x}}{6^{x-5}} = 6^2 \times 6^{\frac{1}{2}}$

$2x+5 = \frac{5}{2}$

$x = -\frac{5}{4}$

Show that $(2x-3)$ is a factor of

$2x^3 + 9x^2 - 32x + 21 = f(x)$

$f\left(\frac{3}{2}\right) = \frac{27}{4} + \frac{81}{4} - 48 + 21 = 0$

$\Rightarrow 2x-3$ factor

Hence, factorise fully

$2x^3 + 9x^2 - 32x + 21$

$= (2x-3)(x^2+6x-7)$

$= (2x-3)(x-1)(x+7)$

$f(x) = \frac{3-x^2}{8}$ for all values of x

Solve $f(2x) = -7$

$\frac{3-(2x)^2}{8} = -7$

$3-(2x)^2 = -56$

$(2x)^2 = 59$

$2x = \pm\sqrt{59}$

$x = \pm\frac{1}{2}\sqrt{59}$ (± 3.84)

Point A lies on the curve
$y = x^2 + 6x + 9$

The x-coordinate of A is 8

Find the equation of the normal to the curve at A.

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

$x=8 \Rightarrow \frac{dy}{dx} = 22,\ y = 121$

Normal is $y - 121 = -\frac{1}{22}(x-8)$

$y = -\frac{1}{22}x + \frac{1335}{11}$