

**2nd November**

Corbettmaths

$(x - 3)$  is a factor of  
 $x^3 + x^2 - 24x + a = f(x)$

Work out the value of  $a$ 

$$f(3) = 27 + 9 - 72 + a = 0$$

$$\Rightarrow a - 36 = 0$$

$$\Rightarrow \underline{a = 36}$$

Use Pascal's triangle to expand

 $(x + y)^4$ 

$$\begin{array}{cccccc}
 & & & & & 1 \\
 & & & & 1 & & \\
 & & & 1 & 2 & 1 & \\
 & & 1 & 3 & 3 & 1 & \\
 1 & 4 & 6 & 4 & 1 & & \\
 \hline
 x^4 + 4x^3y + 6x^2y^2 + 4xy^3 + y^4
 \end{array}$$

Prove  $\sin^2 x - \cos^2 x \equiv 1 - 2\cos^2 x$ 

$$\cos^2 x + \sin^2 x = 1 \Rightarrow \sin^2 x = 1 - \cos^2 x$$

$$\sin^2 x - \cos^2 x = 1 - \cos^2 x - \cos^2 x$$

$$= \underline{1 - 2\cos^2 x}$$

Work out the equation of the tangent to  
 the curve  $y = (x - 5)(x - 3)$   
 at the point where  $x = -2$

$$y = x^2 - 8x + 15$$

$$\frac{dy}{dx} = 2x - 8$$

$$x = -2 \Rightarrow \frac{dy}{dx} = -12, y = 35$$

$$\text{Tgt } \curvearrowright y - 35 = -12(x + 2)$$

$$\Rightarrow y - 35 = -12x - 24$$

$$\Rightarrow \underline{y = -12x + 11}$$