

11th October

Corbettmaths

A circle has a radius of 7

The centre of the circle is $(-3, 4)$

Write down the equation of the circle.

$$(x+3)^2 + (y-4)^2 = 49$$

Work out the coefficient of x^2 in the expansion of $(8 + 3x)^4$

$$\text{Term in } x^2 = {}^4C_2 \times 8^2 \times (3x)^2$$

$$\begin{aligned} \text{Coeff} &= 6 \times 64 \times 9 \\ &= \underline{3456} \end{aligned}$$

$$y = \frac{8x^4 - x^3}{2x}$$

Work out $\frac{d^2y}{dx^2}$

$$y = 4x^3 - \frac{1}{2}x^2$$

$$\frac{dy}{dx} = 12x^2 - x$$

$$\frac{d^2y}{dx^2} = 24x - 1$$

Show that

$$\frac{\cos x}{1 - \sin x} - \frac{\cos x}{1 + \sin x} \equiv 2 \tan x$$

$$\text{LHS} = \frac{\cos x(1 + \sin x) - \cos x(1 - \sin x)}{(1 - \sin x)(1 + \sin x)}$$

$$= \frac{2 \sin x \cos x}{1 - \sin^2 x}$$

$$= \frac{2 \sin x \cos x}{\cos^2 x}$$

$$= \frac{2 \sin x}{\cos x}$$

$$= \underline{2 \tan x}$$