

23rd October



Corbettmaths

$$f(x) = 4x^3 + 5x^2 - 23x - 6$$

Use the factor theorem to show that $(4x + 1)$ is a factor of $f(x)$

$$f\left(-\frac{1}{4}\right) = -\frac{1}{16} + \frac{5}{16} + \frac{23}{4} - 6 = 0$$

$$\Rightarrow \underline{4x + 1 \text{ factor.}}$$

Circle 1 has an equation of $(x + 12)^2 + (y - 4)^2 = 64$

Centre $(-12, 4)$

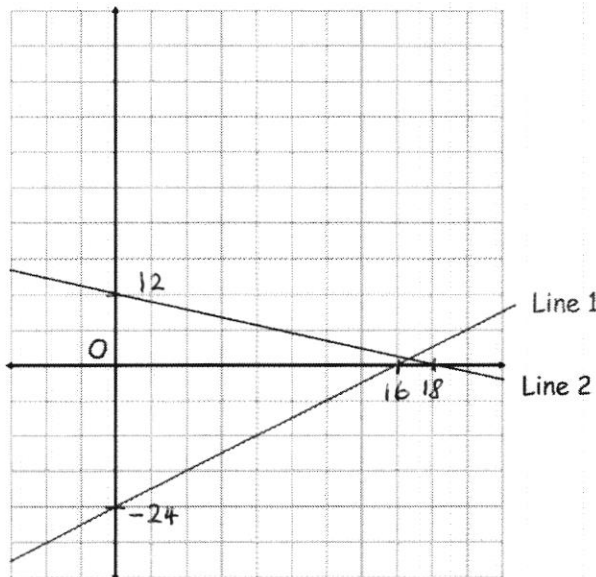
Circle 2 has an equation of $(x - 4)^2 + (y + 2)^2 = 9$

Centre $(4, -2)$

Calculate the distance between the centres of Circle 1 and Circle 2

$$\text{Dist} = \sqrt{16^2 + 6^2} = \sqrt{292}$$

$$= \underline{2\sqrt{73}}$$



Line 1 has equation

$$y = \frac{3}{2}x - 24$$

Are Line 1 and Line 2 perpendicular?

$$\text{Gradient of } L2 = -\frac{12}{18} = -\frac{2}{3}$$

$$\frac{3}{2}x - \frac{2}{3} = -1$$

$$\Rightarrow \underline{L1 \perp L2}$$

Work out the rate of change of y with respect to x at the point on the curve

$$y = (2x + 1)(x^2 + 1) \text{ where } x = -1$$

$$y = 2x^3 + x^2 + 2x + 1$$

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

$$x = -1 \Rightarrow \underline{\frac{dy}{dx} = 6}$$