

10th July



Corbettmaths

Find the gradient of the line passing through the points

$(3\sqrt{5}, \sqrt{5})$ and $(11\sqrt{5}, 3)$

give your answer in the form $a + b\sqrt{5}$

$$\begin{aligned} m &= \frac{3 - \sqrt{5}}{8\sqrt{5}} \times \frac{\sqrt{5}}{\sqrt{5}} \\ &= \frac{3\sqrt{5} - 5}{40} \\ &= -\frac{1}{8} + \frac{3}{40}\sqrt{5} \end{aligned}$$

Solve the simultaneous equations

$$2x + y - z = 3 \quad (1)$$

$$6x + 3y + z = 25 \quad (2)$$

$$4x - 3y - 2z = 1 \quad (3)$$

$$\begin{aligned} (1) + (2) \quad 8x + 4y &= 28 \\ 2 \times (2) + (3) \quad 16x + 3y &= 51 \\ \quad \quad \quad 16x + 8y &= 56 \\ \hline \quad \quad \quad 5y &= 5 \\ \Rightarrow \quad \quad \quad y &= 1 \\ \quad \quad \quad \quad \quad x &= 3 \\ \hline 6 + 1 - z &= 3 \\ \Rightarrow \quad \quad \quad z &= 4 \end{aligned}$$

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

Work out $\frac{dy}{dx}$

$$\begin{aligned} y &= x^3 - \frac{1}{2}x^{-4} \\ \frac{dy}{dx} &= 3x^2 + 2x^{-5} \\ &= 3x^2 + \frac{2}{x^5} \end{aligned}$$

The three vertices of a triangle are A(4, -2), B(4, 5) and C(11, 8)

Calculate the area of triangle ABC

$$\begin{aligned} \frac{1}{2} \times 7 \times 7 \\ = 24.5 \end{aligned}$$

