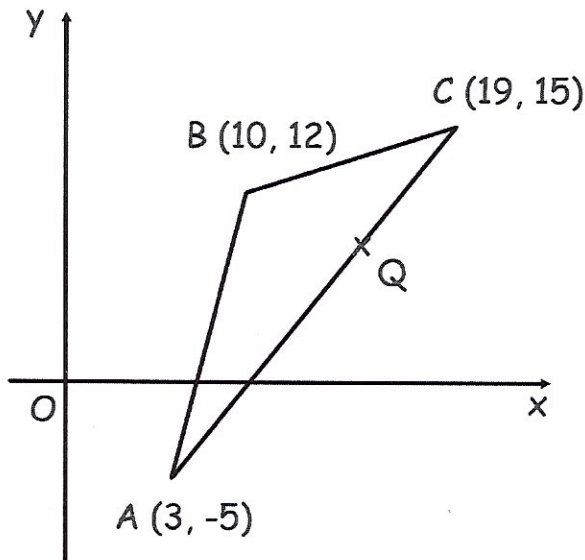


8th May



Corbettmaths

Shown below is triangle ABC



Q is a point on AC such that
AQ:AC = 3:4

Work out the equation of the straight line
that passes through BQ

$$\begin{pmatrix} 16 \\ 20 \end{pmatrix} = \vec{AC} \quad Q(15, 10)$$

$$\vec{AQ} = \begin{pmatrix} 12 \\ 15 \end{pmatrix}$$

$$y = -\frac{2}{5}x + c$$

$$12 = -4 + c$$

$$c = 16$$

$$y = -\frac{2}{5}x + 16$$

Find the range of values of x for which
the function

$$f(x) = 3x^2 - 6x + 8$$

is decreasing

$$\frac{dy}{dx} = 6x - 6$$

$$6x - 6 < 0$$

$$6x < 6$$

$$x < 1$$

Solve $x^3 - 12x^2 + 29x + 42 = 0$

$$f(x) = x^3 - 12x^2 + 29x + 42$$

$$f(1) = 60$$

$$f(0) = 42$$

$$f(-1) = 0 \quad \therefore (x+1) \text{ is a factor}$$

$$(x+1)(x^2 + ax + b) = x^3 - 12x^2 + 29x + 42$$

$$b = 42$$

$$(x+1)(x^2 + ax + 42) = \dots$$

$$ax^2 + x^2 = -12x^2$$

$$a = -13$$

$$(x+1)(x^2 - 13x + 42)$$

$$(x+1)(x-6)(x-7) = 0$$

$$x = -1, 6 \text{ or } 7$$