

24th December



Corbettmaths

The first 4 terms of a sequence are:

504, 494, 479, 459

$$\begin{array}{cccc} -10 & -15 & -20 & \\ & -5 & -5 & \end{array}$$

Which term is the first to be negative?

$$a = -2.5$$

$$b = -2.5$$

$$c = 509$$

$$-2.5n^2 - 2.5n + 509 < 0$$

$$-5n^2 - 5n + 1018 < 0$$

$$a = -5 \quad b = -5 \quad c = 1018$$

$$n = \frac{5 \pm \sqrt{25 + 20360}}{-10} \quad \text{or } n = -14.78 \quad \text{or } n = 13.778$$

14th term (-16)

$$A = \begin{pmatrix} 5 & -2 \\ 3 & 1 \end{pmatrix} \quad B = \begin{pmatrix} -1 & 4 \\ 1 & 2 \end{pmatrix}$$

Work out the matrix **AB**

$$AB = \begin{pmatrix} -7 & 16 \\ -2 & 14 \end{pmatrix}$$

Solve the equation

$$7x - 22x^{\frac{1}{2}} + 16 = 0$$

$$\text{let } y = x^{\frac{1}{2}}$$

$$7y^2 - 22y + 16 = 0$$

$$(7y - 8)(y - 2) = 0$$

$$y = \frac{8}{7} \quad \text{or } y = 2$$

$$x^{\frac{1}{2}} = \frac{8}{7} \quad x^{\frac{1}{2}} = 2$$

$$\therefore x = \frac{64}{49} \quad \text{or } x = 4$$

Work out the stationary points on the curve $y = x^3 - 3x$

$$\frac{dy}{dx} = 3x^2 - 3$$

$$3x^2 - 3 = 0$$

$$3(x^2 - 1) = 0$$

$$3(x-1)(x+1) = 0$$

$$x = 1 \quad \text{or } x = -1$$

(1, -2) and (-1, 2)

Sketch $y = x^3 - 3x$

$$0 = x^3 - 3x$$

$$0 = x(x^2 - 3)$$

$$\therefore x = 0, -\sqrt{3}, \sqrt{3}$$

