

15th November

Corbettmaths

The first 5 terms of a quadratic sequence are

$$-0.5 \quad -3 \quad -6.5 \quad -11 \quad -16.5$$

$$\quad \quad -2.5 \quad -3.5$$

$$\quad \quad \quad -1$$

Find an expression for the nth term

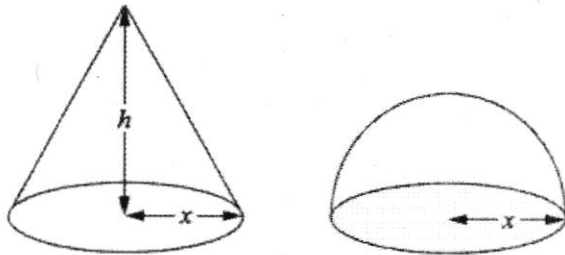
$$t_n = an^2 + bn + c$$

$$2a = -1 \Rightarrow a = -0.5$$

$$3a + b = -2.5 \quad b = -1$$

$$a + b + c = -0.5 \quad c = 1$$

$$\Rightarrow \underline{t_n = -0.5n^2 - n + 1}$$



The diagram shows a cone and a hemisphere.

The hemisphere has base radius x cm.

The cone has base radius x cm and perpendicular height h cm.

The volume of the cone is equal to the volume of the hemisphere.

Show that $h = 2x$

Vol of cone = Vol of hemisphere

$$\frac{1}{3} \pi x^2 h = \frac{2}{3} \pi x^3$$

$$\Rightarrow \underline{h = 2x}$$

$$\begin{pmatrix} 7 & -1 \\ w & 3 \end{pmatrix} \begin{pmatrix} 2 \\ -3 \end{pmatrix} = \begin{pmatrix} 17 \\ -1 \end{pmatrix}$$

Find the value of w

$$2w - 9 = -1$$

$$2w = 8$$

$$\underline{w = 4}$$

Find the coordinates of the maximum point of the curve $y = 32x - x^4$

$$\frac{dy}{dx} = 32 - 4x^3$$

$$\text{At max } 32 - 4x^3 = 0$$

$$x^3 = 8$$

$$x = 2$$

$$\underline{\text{Max } (2, 48)}$$