

12th September



Corbettmaths

$$\frac{y-6}{y^2-2} = w$$

Work out the values of y when $w = 3$

$$\frac{y-6}{y^2-2} = 3$$

$$y-6 = 3y^2-6$$

$$0 = 3y^2 - y$$

$$0 = y(3y-1)$$

$$y = 0, \frac{1}{3}$$

$$f(x) = 400 - x^2 \text{ for all values of } x.$$

Solve $f(2x) = 150$

$$400 - 4x^2 = 150$$

$$4x^2 = 250$$

$$x^2 = \frac{250}{4}$$

$$x = \pm \frac{\sqrt{250}}{2} = \pm 7.906$$

$$\mathbf{A} = \begin{pmatrix} 5 & -4 \\ 0 & 1 \end{pmatrix} \quad \mathbf{B} = \begin{pmatrix} p & q \\ 0 & 1 \end{pmatrix}$$

Given $\mathbf{AB} = \mathbf{I}$

Find p and q

$$\begin{pmatrix} 5 & -4 \\ 0 & 1 \end{pmatrix} \begin{pmatrix} p & q \\ 0 & 1 \end{pmatrix}$$

$$= \begin{pmatrix} 5p & 5q-4 \\ 0 & 1 \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$$

$$\Rightarrow 5p = 1 \quad 5q - 4 = 0$$

$$p = \frac{1}{5} \quad q = \frac{4}{5}$$

For all positive integers, n , prove that $n^3 - n$ is always divisible by 6.

$$n^3 - n = n(n^2 - 1) = (n-1)n(n+1)$$

 $n-1, n, n+1$ 3 consecutive integers ≥ 1 even, 1 multiple of 3

$$2 \times 3 = \underline{6}$$