

**6th August**

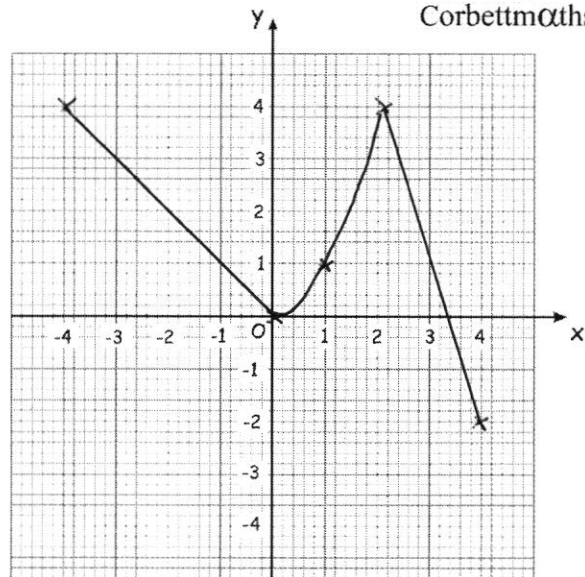
Corbettmaths

A function  $f(x)$  is defined as

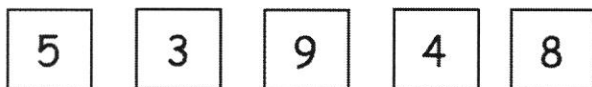
$$f(x) = -x \quad -4 \leq x < 0$$

$$= x^2 \quad 0 \leq x < 2$$

$$= 10 - 3x \quad 2 \leq x \leq 4$$

Draw the graph of  $y = f(x)$ 

Jackson makes 5-digit numbers using all of these cards.



How many different numbers greater than 60000 can Jackson make?

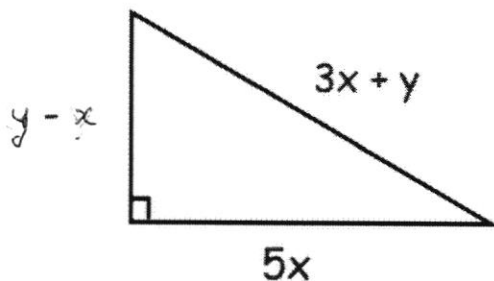
$$\frac{2}{8,9} \times \frac{4}{8,9} \times \frac{3}{8,9} \times \frac{2}{8,9} \times \frac{1}{8,9} = \underline{48}$$

The  $n$ th term of a sequence is  $n^2 + 6n$   
Two consecutive terms in the sequence have a difference of 35

Work out the two terms.

$$\begin{aligned} t_{n+1} &= (n+1)^2 + 6(n+1) \\ &= n^2 + 8n + 7 \\ t_{n+1} - t_n &= 2n + 7 = 35 \\ &\Rightarrow n = 14 \end{aligned}$$

$$\underline{t_{14} = 280}, \quad \underline{t_{15} = 315}$$

Prove  $x : y = 8 : 17$ 

$$\begin{aligned} (5x)^2 + (y-x)^2 &= (3x+y)^2 \\ 25x^2 + y^2 - 2xy + x^2 &= 9x^2 + 6xy + y^2 \\ 17x^2 &= 8xy \\ 17x &= 8y \quad (x > 0) \\ \frac{x}{y} &= \frac{8}{17} \Rightarrow \underline{x : y = 8 : 17} \end{aligned}$$