Name: _____ 5-a-day Further Maths

3rd August

Corbettmaths

Here is a linear sequence

1924 1849 1774 ...

How many terms in the sequence are positive?

$t(n) = -75n + 1999$

$t(n) > 0 \Rightarrow 1999 - 75n > 0$

$\Rightarrow n < 26.6...$

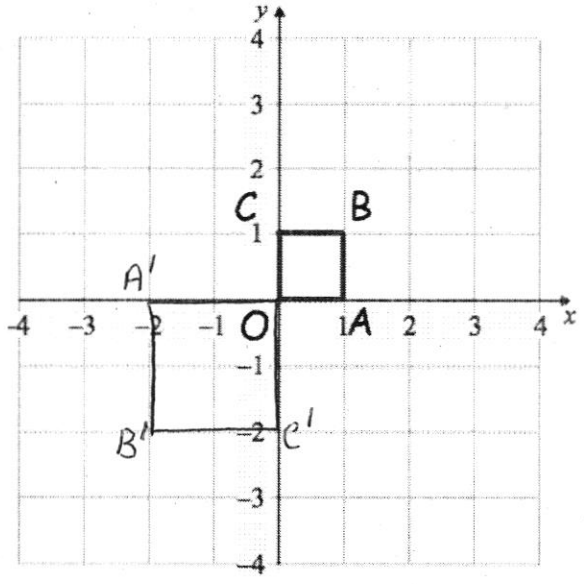
$\Rightarrow$ 26 terms.

OABC is transformed by the matrix $\begin{pmatrix} -2 & 0 \\ 0 & -2 \end{pmatrix}$ to give OA'B'C'

Draw and label OA'B'C'

$\begin{pmatrix} -2 & 0 \\ 0 & -2 \end{pmatrix}\begin{pmatrix} 0 & 1 & 1 & 0 \\ 0 & 0 & 1 & 1 \end{pmatrix} = \begin{pmatrix} 0 & -2 & -2 & 0 \\ 0 & 0 & -2 & -2 \end{pmatrix}$

A' B' C'



Describe the transformation fully.

Enlargement centre O, s.f. -2

$f(x) = \sqrt{x^2 + 10x - c}$

with domain all values of x.

Work out the possible values of c.

Min value of $x^2+10x-c$ must $\geqslant 0$

$x^2+10x-c = (x+5)^2 - 25 - c$

$\geqslant -25 - c$

$-25 - c \geqslant 0 \Rightarrow c \leqslant -25$

Given $f(x) = 3x^3 - 9x^2 + 10x + 1$

Show $f(x)$ is a increasing function for all values of x

$f'(x) = 9x^2 - 18x + 10$

$= 9[x^2 - 2x] + 10$

$= 9[(x-1)^2 - 1] + 10$

$= 9(x-1)^2 + 1 \geqslant 1 > 0$

$\Rightarrow f(x)$ increasing.