Name: _____ 5-a-day Further Maths

4th October

Corbettmaths

Find the range of values of x that satisfies both

$x^2 + 2x - 15 \leq 0$ and $x^2 < 16$

$(x+5)(x-3) \leq 0$

$-5 \leqslant x \leqslant 3$ $\quad -4 < x < 4$

$-4 < x \leqslant 3$

x : y = 2 : 7

y : z = 5 : 13

Write x in terms of z

$\frac{x}{y} = \frac{2}{7} \Rightarrow x = \frac{2}{7}y$

$\frac{y}{z} = \frac{5}{13} \Rightarrow y = \frac{5}{13}z$

$\Rightarrow x = \frac{2}{7} \times \frac{5}{13}z$

$\Rightarrow x = \frac{10}{91}z$

Expand and simplify

$(x^3 + \frac{1}{x^2})(x - \frac{1}{x^2})$

$= x^4 - x + \frac{1}{x} - \frac{1}{x^4}$

The unit square OABC is transformed by a reflection in the x-axis followed by enlargement scale factor 2, centre the origin.

What is the matrix of the combined transformation?

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