17th November

Corbettmaths

Expand and simplify fully

$(3w + 1)(2w + 5)(w + 2)$

$= (3w+1)(2w^2 + 9w + 10)$

$= 6w^3 + 27w^2 + 30w + 2w^2 + 9w + 10$

$= 6w^3 + 29w^2 + 39w + 10$
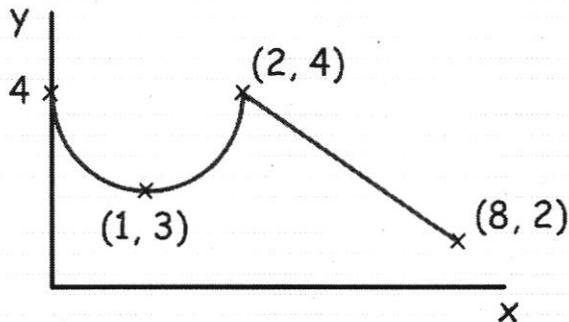
$f(x) = (x - a)^2 + b$ for $0 \leq x < 2$

$\qquad = cx + d \qquad$ for $2 \leq x \leq 8$

Work out the values of a, b, c and d

$0 \leqslant x < 2 \quad f(x) = (x-1)^2 + 3$

$2 \leqslant x \leqslant 8 \quad f(x) = cx + d$

$f(2) = 4 \qquad\qquad 2c + d = 4$

$f(8) = 2 \qquad\qquad 8c + d = 2$

$\qquad\qquad\qquad\qquad\quad 6c \quad = -2$

$a = 1, \; b = 3, \quad c = -\frac{1}{3}, d = \frac{14}{3}$

The transformation matrix $\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$

maps point P to point Q.

The transformation matrix $\begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$

maps point Q to point R.

Point P is $(0, 4)$.

Work out the coordinates of point R.

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

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

$= \begin{pmatrix} -4 \\ 0 \end{pmatrix} \qquad R(-4, 0)$