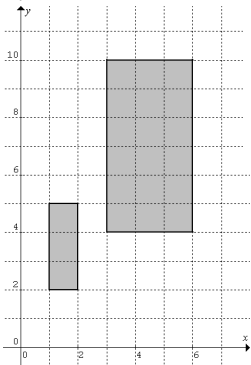
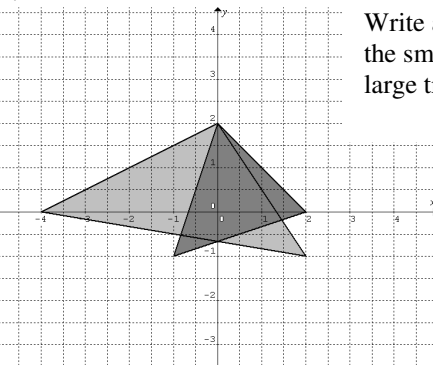
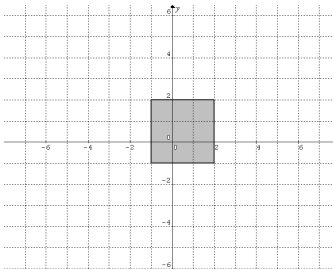
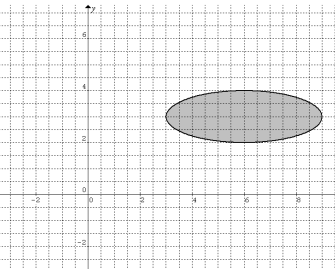


= Year 12 mm = Matrices (Transformations) = Worksheet 5

<p>1.</p>  <p>Write a matrix to transform the large rectangle to the small rectangle.</p>	<p>2.</p>  <p>Write a matrix to transform the small triangle to the large triangle.</p>
<p>3.</p>  <p>Sketch the resultant shape under the transformation T defined by</p> $T\left(\begin{bmatrix} x \\ y \end{bmatrix}\right) = \begin{bmatrix} 2 & 0 \\ 0 & -3 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} + \begin{bmatrix} -1 \\ 1 \end{bmatrix}$	<p>4.</p>  <p>Sketch the resultant shape under the transformation T defined by</p> $T\left(\begin{bmatrix} x \\ y \end{bmatrix}\right) = \begin{bmatrix} \frac{2}{3} & 0 \\ 0 & 2 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} - \begin{bmatrix} 4 \\ 6 \end{bmatrix}$
<p>5. The transformation T is defined by</p> $T\left(\begin{bmatrix} x \\ y \end{bmatrix}\right) = \begin{bmatrix} -\frac{1}{2} & 0 \\ 0 & 3 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} + \begin{bmatrix} 1 \\ -6 \end{bmatrix}$ <p>Find the image of the curve</p> $y = 2(x-2)^2 + 2.$	<p>6. Refer to Q5. Find T^{-1}.</p>
<p>7. $f(x)$ is transformed to $1 + \frac{1}{2}f(3-2x)$ under T defined by</p> $T\left(\begin{bmatrix} x \\ y \end{bmatrix}\right) = \begin{bmatrix} a & b \\ c & d \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} + \begin{bmatrix} e \\ f \end{bmatrix}.$ <p>Find the values of a, b, c, d, e and f.</p>	<p>8. Refer to Q7. Find T^{-1}.</p>
<p>Numerical, algebraic and worded answers.</p> <p>1. $\begin{bmatrix} \frac{1}{3} & 0 \\ 0 & \frac{1}{2} \end{bmatrix}$ 2. $\begin{bmatrix} -2 & 0 \\ 0 & 1 \end{bmatrix}$ 3. $y = 24x^2$ 4. $T^{-1}\left(\begin{bmatrix} x \\ y \end{bmatrix}\right) = \begin{bmatrix} -2 & 0 \\ 0 & \frac{1}{3} \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} + \begin{bmatrix} 2 \\ 2 \end{bmatrix}$ 5. $a = -2, b = 0, c = 0, d = 2, e = 3, f = -2$ 6. $T^{-1}\left(\begin{bmatrix} x \\ y \end{bmatrix}\right) = \begin{bmatrix} -\frac{1}{2} & 0 \\ 0 & \frac{1}{2} \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} + \begin{bmatrix} \frac{3}{2} \\ 1 \end{bmatrix}$</p>	