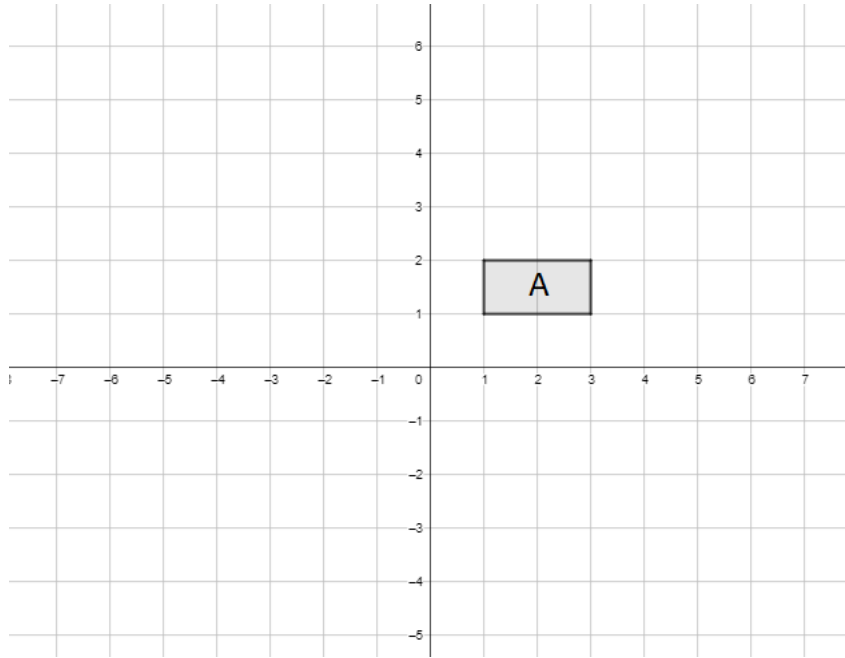
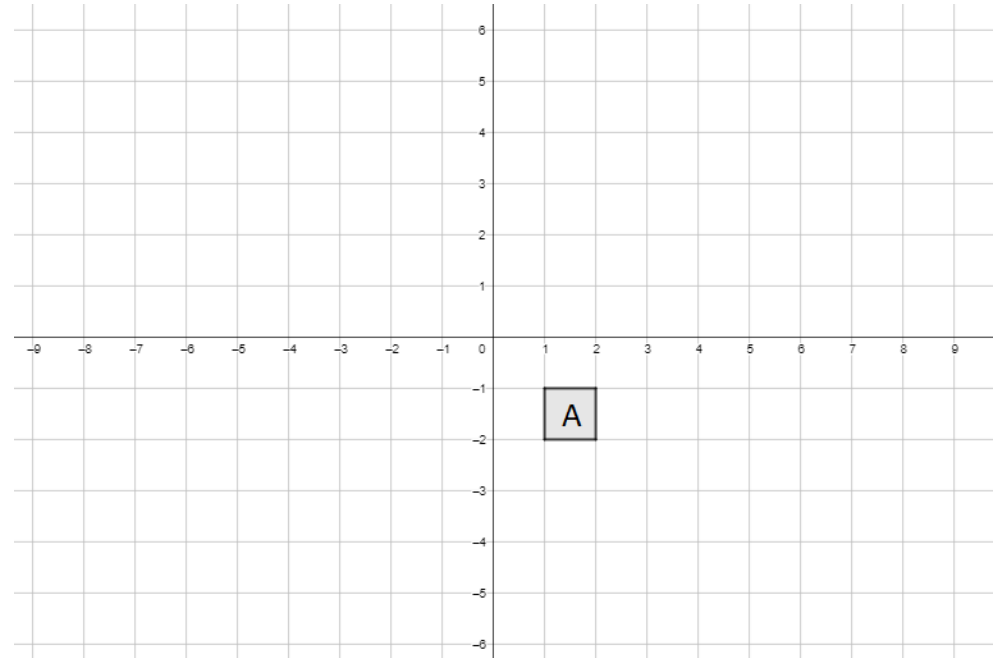


**Translations – If they don't fit, draw as much as you can! [www.m4ths.com](http://www.m4ths.com)**



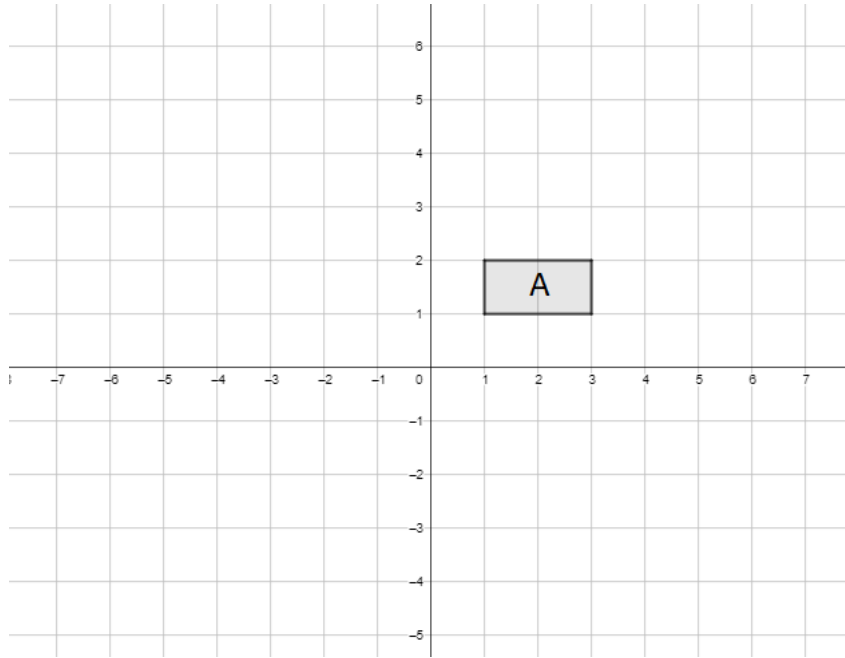
1. Translate Shape A by the vector  $\begin{pmatrix} 3 \\ 1 \end{pmatrix}$  and label it B
2. Translate Shape A by the vector  $\begin{pmatrix} 2 \\ -1 \end{pmatrix}$  and label it C
3. Translate Shape A by the vector  $\begin{pmatrix} 0 \\ 5 \end{pmatrix}$  and label it D
4. Translate Shape A by the vector  $\begin{pmatrix} -3 \\ -2 \end{pmatrix}$  and label it E
5. Translate Shape A by the vector  $\begin{pmatrix} -4 \\ 0 \end{pmatrix}$  and label it F
6. Translate Shape A by the vector  $\begin{pmatrix} 5 \\ -3 \end{pmatrix}$  and label it G
7. Translate Shape A by the vector  $\begin{pmatrix} -3 \\ 1 \end{pmatrix}$  and label it H
8. State fully the single transformation that maps Shape B to Shape D
9. State fully the single transformation that maps Shape E to Shape A
10. State fully the single transformation that maps Shape C to Shape G
11. State fully the single transformation that maps Shape H to Shape A
12. Shape A is reflected in the  $x$  axis. State the translation that would produce the same result.
13. Can a translation change which way round the shape is?

**Reflections – If they don't fit, draw as much as you can! [www.m4ths.com](http://www.m4ths.com)**



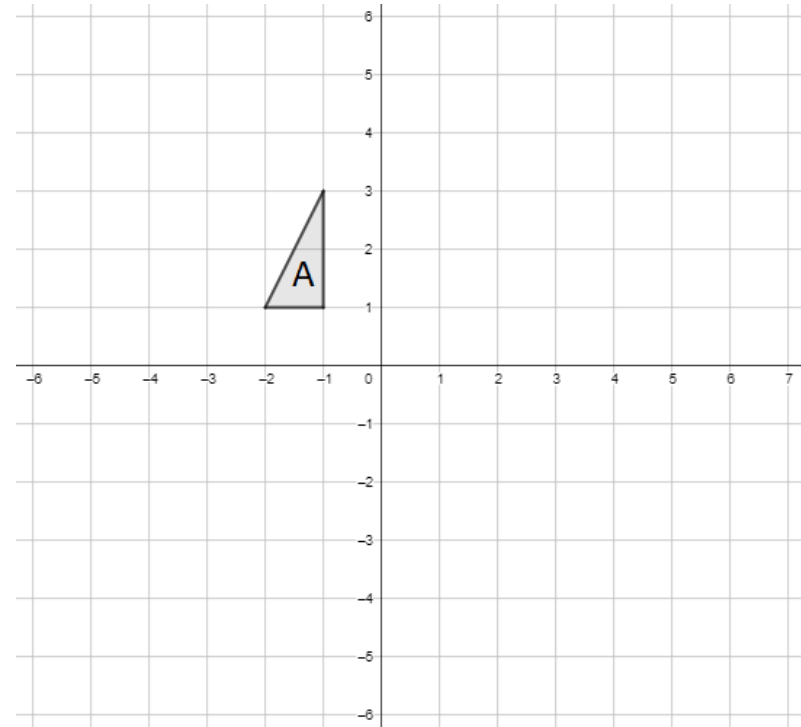
1. Reflect Shape A in the  $x$  axis. Label it Shape B
2. Reflect Shape A in the  $y$  axis. Label it Shape C
3. Reflect Shape A in the line  $y = -3$  and label it Shape D
4. Reflect Shape A in the line  $x = -2$  and label it Shape E
5. Reflect Shape A in the line  $y = 1$  and label it Shape F
6. Reflect Shape A in the line  $x = -4$  and label it Shape G
7. Reflect Shape A in the line  $y = 2$  and label it Shape H
8. Reflect Shape A in the line  $y = 0$  and label it Shape I
9. Explain the relationship between I and B.
10. Shape A is reflected in the line  $y = 3$ . State fully another transformation that will give the same result as a reflection in the line  $y = 3$ .
11. Reflect Shape A in the line  $y = x$  and label it Shape J
12. Reflect Shape A in the line  $y = -x$  and label it Shape K
13. Find a translation which also maps A to J
14. Find a translation which also maps A to J

**Rotations – If they don't fit, draw as much as you can! [www.m4ths.com](http://www.m4ths.com)**



1. Rotate Shape A  $90^\circ$  anticlockwise about (0,0) and label it B
2. Rotate Shape A  $90^\circ$  anticlockwise about (-1,0) and label it C
3. Rotate Shape A  $90^\circ$  clockwise about (3,1) and label it D
4. Rotate Shape A  $180^\circ$  clockwise about (2,0) and label it E
5. Rotate Shape A  $270^\circ$  anticlockwise about (4,0) and label it F
6. Rotate Shape A a quarter turn clockwise about (3,4) and label it G
7. State fully a single transformation that maps Shape B to Shape D
8. State fully a different single transformation that maps Shape B to D
9. State fully a single transformation that maps Shape E to Shape A
10. State fully a different single transformation that maps Shape E to A
11. Find the rotation that maps Shape B to Shape D
12. State fully the single transformation that maps Shape C to Shape G
13. State a common error that students make when describing a rotation.
14. State a common error that students make when describing a reflection.
15. State a common error that students make when describing a translation

**Enlargements (Basic) – If they don't fit, draw as much as you can!**



1. Enlarge Shape A by a SF (Scale Factor) of 2 **anywhere** & label it B
2. Enlarge Shape A by a SF (Scale Factor) of 3 **anywhere** & label it C
3. Enlarge Shape A by a SF (Scale Factor) of 4 **anywhere** & label it D
4. Enlarge Shape A by a SF (Scale Factor) of  $\frac{1}{2}$  **anywhere** & label it E
5. State FULLY the single transformation that maps Shape B to Shape A.
6. State FULLY the single transformation that maps Shape C to Shape A.
7. State FULLY the single transformation that maps Shape E to Shape A.
8. Enlarge Shape A by a SF of 2 **about (0,0)** and label it F.
9. Enlarge Shape A by a SF of 3 **about (0,1)** and label it G.
10. \* Enlarge shape A by a SF -2 about (0,0) and label it H.
11. \* Enlarge shape A by a SF -3 about (0,0) and label it I.
12. \* Shape A is enlarged by a SF -1 about (0,0). State fully ANOTHER single transformation that gives the same result.