

## Transformations

1. Find the image when the object point  $(3, -2)$  is reflected in the line  $y = 1$ .  $(3, 4)$
2. Find the image when the object point  $(-1, -2)$  is translated by  $\begin{pmatrix} -3 \\ 4 \end{pmatrix}$ .  $(-4, 2)$
3. Find the image when the object point  $(2, 3)$  is rotated  $90^\circ$  clockwise about the origin.  $(3, -2)$
4. Find the image when the object point  $(3, 4)$  is enlarged by scale factor 2 about  $(1, 0)$ .  $(5, 8)$
5. Find the image when the object point  $(3, -1)$  is reflected in the line  $y = -x$ .  $(1, -3)$
6. Find the image when the object point  $(-1, 5)$  is translated by  $\begin{pmatrix} \frac{1}{3} \\ -4 \end{pmatrix}$ .  $(-\frac{2}{3}, 1)$
7. Find the image when the object point  $(-2, 1)$  is rotated  $180^\circ$  clockwise about  $(0, -1)$ .  $(2, -3)$
8. Find the image when the object point  $(4, 8)$  is enlarged by scale factor  $\frac{1}{2}$  about  $(2, 0)$ .  $(3, 4)$
9. Find the image when the object point  $(3, 0)$  is reflected in the line  $y = x + 1$ .  $(-1, 4)$
10. Find the image when the object point  $(-2, 1)$  is rotated  $90^\circ$  anticlockwise about  $(1, 1)$ .  $(1, -2)$
11. Find the image when the object point  $(-2, 5)$  is enlarged by scale factor  $-1$  about  $(-1, 2)$ .  $(0, -1)$
12. Find the image when the object point  $(-4, -5)$  is reflected in the line  $y = -x - 4$ .  $(1, 0)$
13. Find the image when the object point  $(2, 1)$  is translated by  $\begin{pmatrix} 2\pi \\ \pi \end{pmatrix}$ .  $(2 + 2\pi, 1 + \pi)$
14. Find the image when the object point  $(-6, 7)$  is rotated  $90^\circ$  clockwise about  $(-5, 2)$ .  $(0, 3)$
15. Find the image when the object point  $(1, -1)$  is enlarged by scale factor  $-2$  about  $(-1, -3)$ .  $(-5, -7)$
16. Find the image when the object point  $(-4, -7)$  is reflected in the line  $y = x - 2$ .  $(-5, -6)$
17. Find the image when the object point  $(a, b)$  is translated by  $\begin{pmatrix} c \\ -c \end{pmatrix}$ .  $(a + c, b - c)$
18. Find the image when the object point  $(a, b)$  is rotated  $90^\circ$  clockwise about the origin.  $(b, -a)$
19. Find the image when the object point  $(3, 7)$  is enlarged by scale factor  $-\frac{1}{2}$  about  $(1, 3)$ .  $(0, 1)$
20. Find the image when the object point  $(a, b)$  is reflected in the line  $y = x$ .  $(b, a)$
21. Find the image when the object point  $(a, b)$  is enlarged by scale factor  $-2$  about the origin.  $(-2a, -2b)$