## Challenge 1

1. Label the vertices: $F(-2,8) \cup(-4,6) N(-2,2)$
2. Reflect across the $y$-axis
3. Translate 6 units right and 1 unit up
4. Reflect across the $x$-axis

## Challenge 2

1. Label the vertices: $M(5,-7) E(5,-4) \cap(7,-2) G(9,-4) S(9,-7)$
2. Rotate $180^{\circ}$ around the origin
3. Reflect across the $y$-axis
4. Reflect across the $x$-axis

## Challenge 3

1. Label the vertices: $K(-8,2) \|(-7,4) T(-4,2) E(-5,-2)$
2. Reflect across the $x$-axis
3. Rotate $90^{\circ}$ counterclockwise around the origin
4. Translate using $(x+2, y+5)$

## Challenge 4 (be very careful on this one! It's easy to mix up the letters!)

1. Graph the rectangle: $\mathrm{W}(-3,6) I(-3,8) \mathrm{O}(3,8) \mathrm{A}(3,6)$
2. Translate 4 units left and 1 unit down
3. Reflect across the $y$-axis
4. Rotate $90^{\circ}$ clockwise around the origin
5. Reflect across the line $x=2$

## Challenge 5

1. Graph the triangle: $\mathrm{P}(-1,1) \cup(-1,3) \mathrm{G}(3,3)$
2. Reflect across the line $x=-3$.
3. Reflect across the line $y=-3$.
4. Reflect across the line $x=-1$.
5. Rotate $450^{\circ}$ counterclockwise.

## Challenge 6 (challenge - should attempt!)

1. Label the vertices of the rectangle: $A(-1,5) B(-1,7) C(3,7) D(3,5)$
2. Reflect $A B C D$ across the line $y=x$. (This is the diagonal line graphed on the page)
3. Label the vertices of the quadrilateral: $E(-5,-7) F(-5,-9) G(3,-5) H(-2,-5)$ and reflect it across $y=x$.

## Challenge 7 (challenge - should attempt!)

- Triangle ABC was rotated $90^{\circ}$ counterclockwise about the origin, then translated 3 units right and 7 units up. The vertices of the image are $A^{\prime \prime}(7,6) ; B^{\prime \prime}(7,2) ; C^{\prime \prime}(5,2)$. Try to work backwards to find out the original location of triangle $A B C$.

