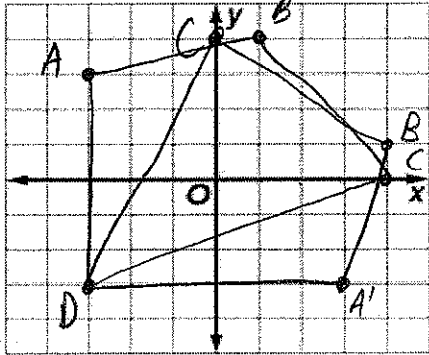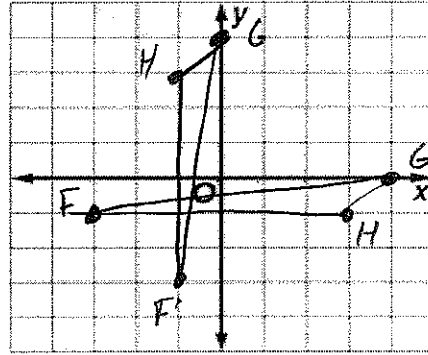# 9.2 Warm-Up

COORDINATE GEOMETRY Graph each figure and its image under the given reflection.
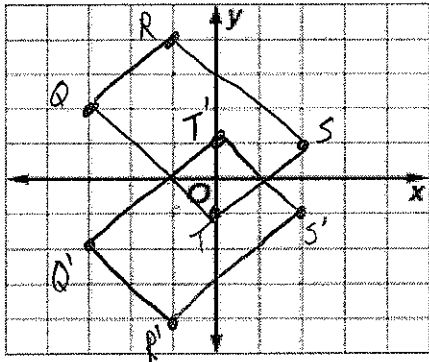
1. Quadrilateral *ABCD* with vertices
   A(−3, 3), *B*(1, 4), *C*(4, 0), and
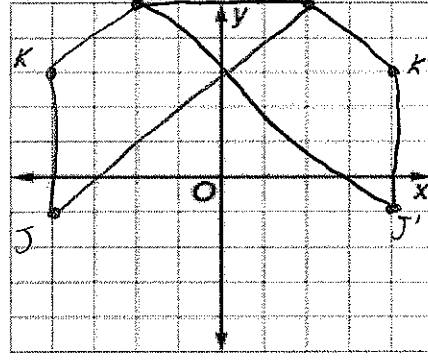   *D* (−3, −3) in the line $y = x$

2. △*FGH* with vertices *F*(−3, −1), *G*(0, 4)
   and *H*(3, −1) in the line $y = x$

3. Rectangle *QRST* with vertices *Q*(−3, 2),
   R(−1, 4), *S*(2, 1), and *T*(0, −1)
   in the *x*-axis

4. Trapezoid *HIJK* with vertices *H*(−2, 5),
   I(2, 5), *J*(−4, −1), and *K*(−4, 3)
   in the *y*-axis

9.2 Translations

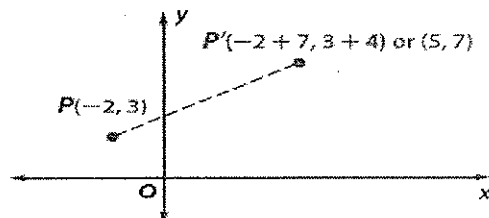Target: Use properties of translations in the coordinate plane.

Vector- a way to move along the coordinate plane.

💲 KeyConcept Translation in the Coordinate Plane

Words	To translate a point along vector $\langle a, b \rangle$, add *a* to the *x*-coordinate and *b* to the *y*-coordinate.
Symbols	$(x, y) \rightarrow (x + a, y + b)$
Example	The image of *P*(−2, 3) translated along vector $\langle 7, 4 \rangle$ is *P*′(5, 7).

$P'(-2 + 7, 3 + 4)$ or $(5, 7)$

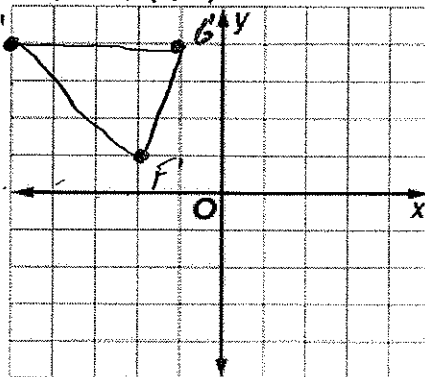$P(-2, 3)$

Example 2 Translations in the Coordinate Plane

Graph each figure and its image along the given vector.

a. $\triangle EFG$ with vertices $E(-7, -1)$, $F(-4, -4)$, and $G(-3, -1)$; $\langle 2, 5 \rangle$
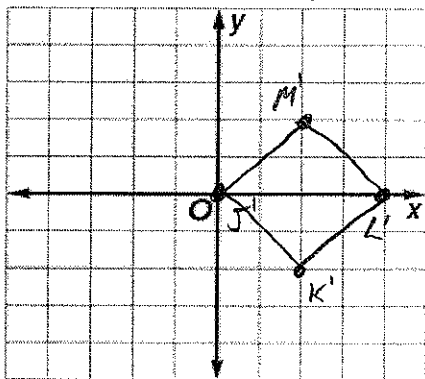
$E(-7, -1)$ $E'(-7+2, -1+5)$ $E'(-5, 4)$

$F(-4, -4)$ $F'(-4+2, -4+5)$ $F'(-2, 1)$

$G(-3, -1)$ $G'(-3+2, -1+5)$ $G'(-1, 4)$

b. square $JKLM$ with vertices $J(3, 4)$, $K(5, 2)$, $L(7, 4)$, and $M(5, 6)$; $\langle -3, -4 \rangle$
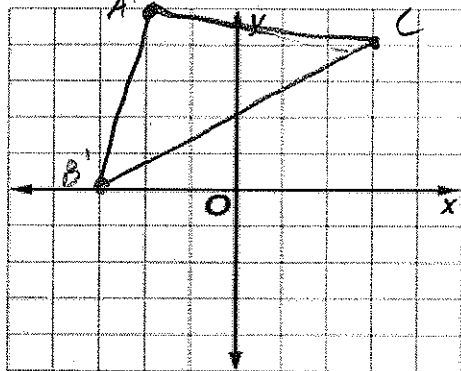
$J'(0, 0)$ $K'(2, -2)$ $L'(4, 0)$ $M'(2, 2)$

Guided Practice

2A. $\triangle ABC$ with vertices $A(2, 6)$, $B(1, 1)$, and $C(7, 5)$; $\langle -4, -1 \rangle$

$A'(-2, 5)$ $B'(-3, 0)$ $C'(3, 4)$

2B. quadrilateral $QRST$ with vertices $Q(-8, -2)$, $R(-9, -5)$, $S(-4, -7)$, and $T(-4, -2)$; $\langle 7, 1 \rangle$

$Q'(-1, -1)$ $R'(-2, -4)$ $S'(3, -6)$

$T'(3, -1)$