

Study Guide

Integration: Geometry Translations

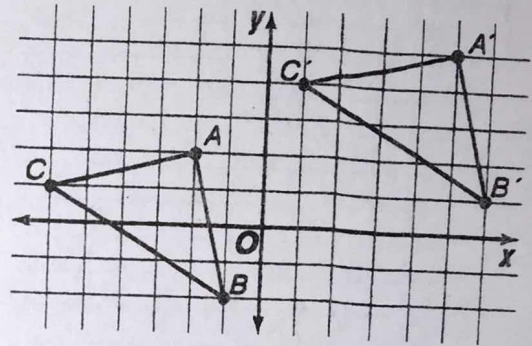
To **translate** a figure in the direction described by an ordered pair, add the ordered pair to the coordinates of each vertex of the figure.

Example The vertices of $\triangle ABC$ are $A(-2, 2)$, $B(-1, -2)$, and $C(-6, 1)$. Graph the triangle. Then graph the triangle after a translation 7 units right and 3 units up.

$$\begin{aligned} A(-2, 2) + (7, 3) &\longrightarrow A'(5, 5) \\ B(-1, -2) + (7, 3) &\longrightarrow B'(6, 1) \\ C(-6, 1) + (7, 3) &\longrightarrow C'(1, 4) \end{aligned}$$

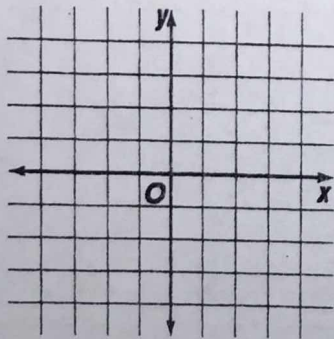
The vertices of the translated figure are $A'(5, 5)$, $B'(6, 1)$, and $C'(1, 4)$.

Graph $\triangle ABC$ and $\triangle A'B'C'$.

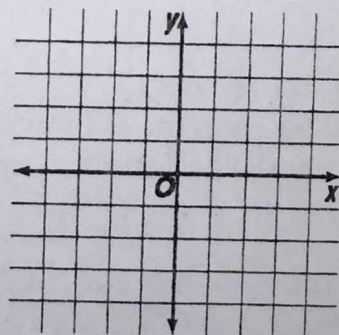


Find the coordinates of the vertices of each figure after the translation described. Then graph the figure and its translation.

1. $\triangle XYZ$ with vertices $X(-1, 2)$, $Y(2, 3)$, and $Z(3, -1)$, translated by $(-2, -3)$



2. polygon $KLMN$ with vertices $K(-1, 1)$, $L(-3, 0)$, $M(-2, -3)$, $N(0, -2)$, translated by $(4, 3)$



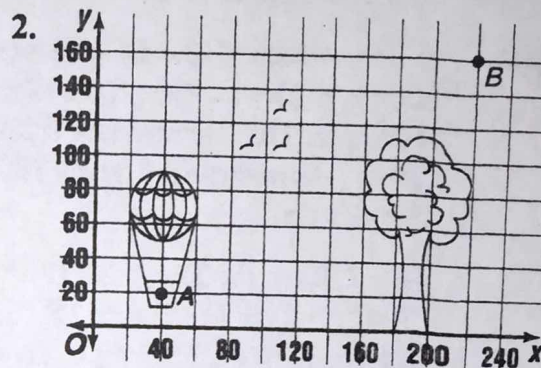
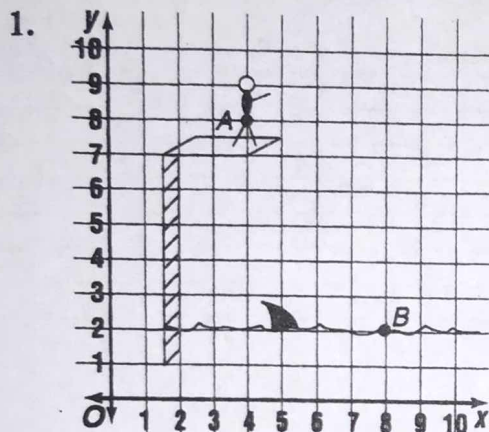
Find the coordinates of the vertices of each figure after the translation described.

3. $\triangle DEF$ with vertices $D(0, 5)$, $E(-1, 3)$, and $F(-3, 4)$, translated by $(2, -1)$

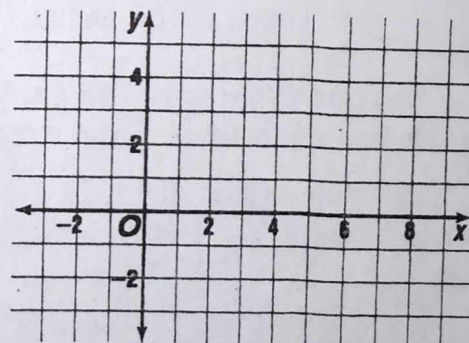
4. pentagon $ABCDE$ with vertices $A(4, -1)$, $B(3, 2)$, $C(1, 4)$, $D(-2, 1)$, and $E(-3, -3)$, translated by $(-2, 1)$

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Name the coordinates of the ordered pair needed to translate each point A to point B.

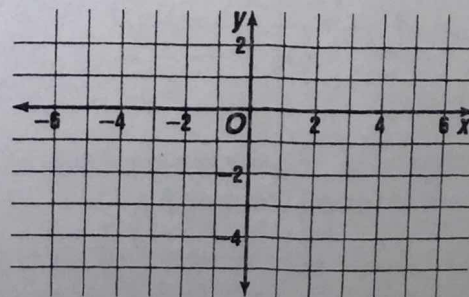


3. Translate $\triangle ABC$ with vertices $A(-1, 4)$, $B(0, 0)$, and $C(2, 3)$ by $(5, -2)$. Then graph $\triangle A'B'C'$.



4. Rectangle $QRST$ has vertices $Q(-1, -2)$, $R(-2, 1)$, $S(4, 3)$, and $T(5, 0)$. Find the coordinates of the vertices of $Q'R'S'T'$ after a translation described by $(1, -2)$.

5. The coordinates of the vertices of $\triangle ABC$ are $A(3, -1)$, $B(0, 2)$ and $C(3, -2)$. Find the coordinates of the vertices of $\triangle A'B'C'$, which is $\triangle ABC$ translated by $(-3, -2)$. Then graph $\triangle ABC$ and its translation.



6. Square $ABCD$ has vertex $A(-5, -12)$. When translated, A' has coordinates $(6, 10)$. Describe the translation using an ordered pair.