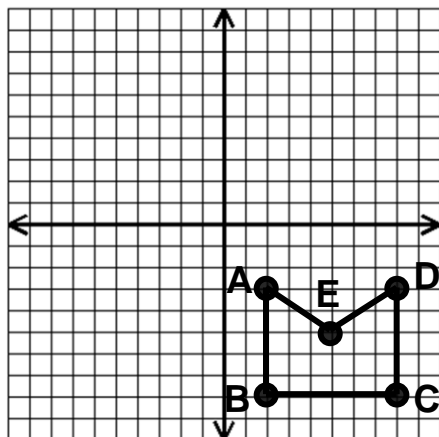


## TOPIC 20-1: TRANSLATIONS

**Translation:** A transformation that shifts or slides every point of a figure or graph the same distance in the same direction.

**EXAMPLE 1:** Translate the figure left 6 and up 8 or  $(x - 6, y + 8)$ . Give the coordinates of the new points.



A' ( \_\_\_\_\_, \_\_\_\_\_ )

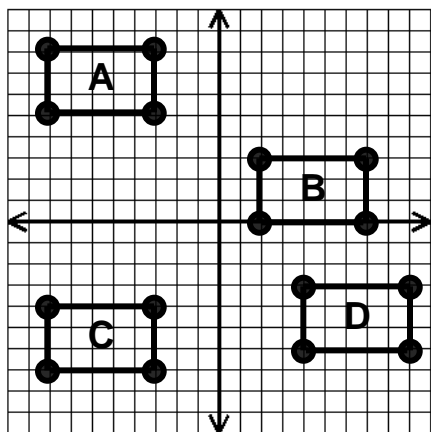
B' ( \_\_\_\_\_, \_\_\_\_\_ )

C' ( \_\_\_\_\_, \_\_\_\_\_ )

D' ( \_\_\_\_\_, \_\_\_\_\_ )

E' ( \_\_\_\_\_, \_\_\_\_\_ )

**EXAMPLE 2:** Describe each as an ordered pair translation.



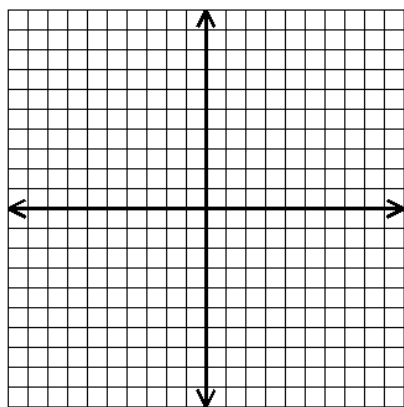
1) A to B: \_\_\_\_\_

2) B to D: \_\_\_\_\_

3) D to C: \_\_\_\_\_

**Three-dimensional figures can be made using translations...**

**EXAMPLE 3:** Plot the points A(-4, -4), B(-4, 1), C(1, 1), D( 1, -4).



- 1) Connect the points in order.
- 2) Translate the figure 4 units right and 3 units up.
- 3) Draw segments  $\overline{AA'}$ ,  $\overline{BB'}$ ,  $\overline{CC'}$ , and  $\overline{DD'}$ .
- 4) What type of figure have you made?

**EXAMPLE 4:** Using the figure you generated in EXAMPLE 3, find the following:

- a) intersection of  $ABB'A'$  and  $A'B'C'D'$ : \_\_\_\_\_
- b) intersection of  $ABCD$  and  $\overline{CC'}$ : \_\_\_\_\_
- c) Name a segment skew to  $\overline{BC}$ : \_\_\_\_\_
- d) Find the equation of the line containing  $\overline{C'D'}$ : \_\_\_\_\_
- e) Find the equation of the perpendicular bisector of  $\overline{AB}$ : \_\_\_\_\_

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**EXAMPLE 5:** What is the image of the point  $A(2, 3)$  under the translation that shifts  $(x, y)$  to  $(x - 2, y + 4)$  ?

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**EXAMPLE 6:** A translation moves  $B(-1, 4)$  onto  $B'(0, -6)$ . What is the image of  $C(-2, -5)$  under that same translation.

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**EXAMPLE 7:** In a marching drill, it takes 8 steps to march 5 yards. A drummer starts 8 steps to the left and 8 steps up from the center of the field. She marches 16 steps to the right of her second position. Then she marches 24 steps down the field to her final position. What is the drummer's final position? What single vector represents the translation from the starting position to