

Students should be able to answer these questions after Lesson 6.3:

- How are translations performed using the coordinate system?
- What is the relationship between reflections and translations?

Directions

Read Question 1 and its solution. Then complete Question 2.

1. A rectangle with vertices $(-2, 3)$, $(-2, 8)$, $(5, 3)$, and $(5, 8)$ is shifted vertically by 4 units. Find the coordinates of the new image.

Step 1 Because the image is shifted vertically, the y -coordinate will change by 4 units. The x -coordinate will not change.

The coordinates become: $(-2, 3 + 4)$, $(-2, 8 + 4)$, $(5, 3 + 4)$,
 $(5, 8 + 4) = (-2, 7)$, $(-2, 12)$, $(5, 7)$, $(5, 12)$.

2. A triangle with vertices $(-3, 0)$, $(0, 5)$, and $(4, 0)$ is shifted horizontally 7 units. Find the coordinates of the new image.

Read Question 3 and its solution. Then complete Question 4.

3. The vertices of a square are $A(-5, 0)$, $B(5, 0)$, $C(-5, 4)$, and $D(5, 4)$. This square is transformed by using the translation $(x, y) \rightarrow (x + 1, y - 2)$. Describe the movement of the preimage that will create the image. Use a complete sentence in your answer.

Step 1 The square will be shifted horizontally to the right 1 unit, and vertically down by 2 units.

4. The vertices of a triangle are $A(1, 2)$, $B(-2, 5)$, and $C(0, -7)$. This triangle is transformed by using the translation $(x, y) \rightarrow (x - 2, y + 3)$. Describe the movement of the preimage that will create the image, and provide the coordinates of the image's vertices. Use complete sentences in your answer.

Skills Practice

Name _____ Date _____

Web Page Design Translations

Vocabulary

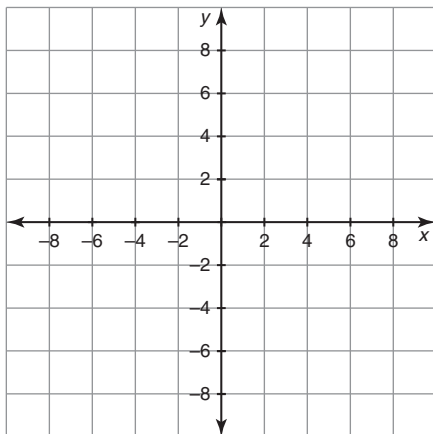
Write the term that best completes each statement.

1. A(n) _____ is a transformation in which a figure is shifted so that each point of the figure moves the same distance in the same direction.
2. A(n) _____ is a translation in which the preimage is moved either left or right to create the image.
3. The starting point of a translation is called the _____.
4. A(n) _____ is a directed line segment that has both a magnitude and a direction.
5. The endpoint of a vector is called the _____.
6. A(n) _____ is a translation in which the preimage is moved either up or down to create the image.

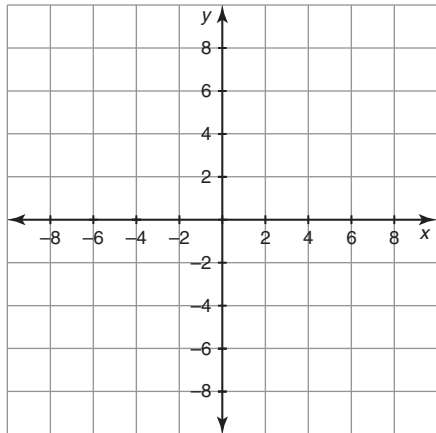
Problem Set

Use coordinate notation to determine the coordinates of the image. Then graph the preimage, image, and vectors.

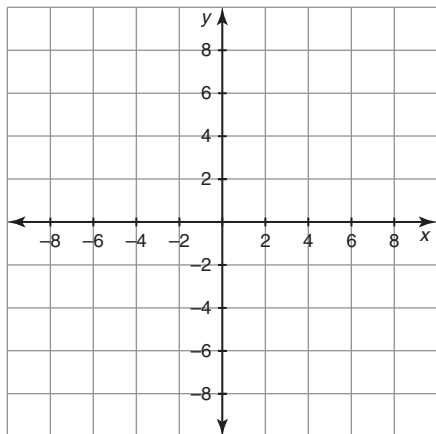
7. $\triangle ABC$ has vertices $A(1, 2)$, $B(3, 6)$, and $C(9, 7)$. What are the vertices of the image after the triangle is translated 4 units left and 6 units down?



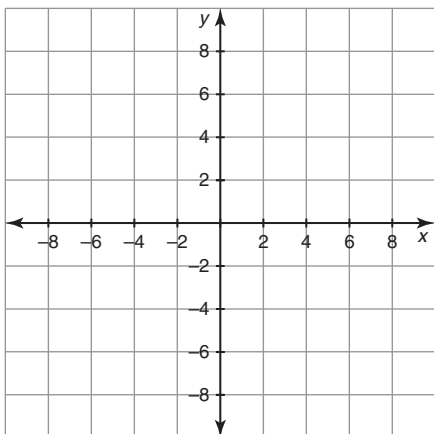
8. $\triangle DEF$ has vertices $D(8, -4)$, $E(2, -6)$, and $F(3, -1)$. What are the vertices of the image after the triangle is translated 6 units left and 5 units up?



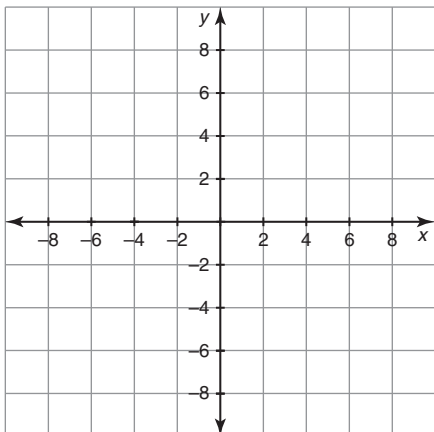
9. $\triangle GHI$ has vertices $G(0, 5)$, $H(4, -2)$, and $I(-3, 3)$. What are the vertices of the image after the triangle is translated 4 units right and 5 units up?



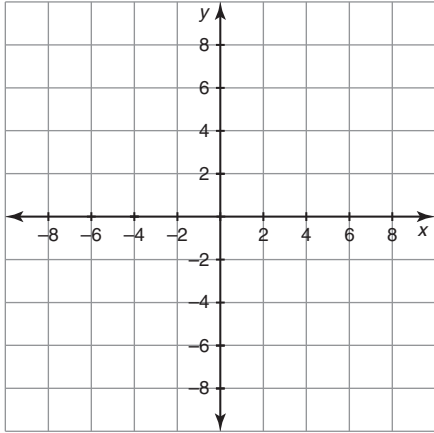
10. $\triangle JKL$ has vertices $J(-6, 2)$, $K(-1, 3)$, and $L(-7, 0)$. What are the vertices of the image after the triangle is translated 8 units right and 3 units up?



11. $\triangle MNO$ has vertices $M(-5, -9)$, $N(-1, -7)$, and $O(-6, -2)$. What are the vertices of the image after the triangle is translated 2 units left and 11 units up?



12. $\triangle PQR$ has vertices $P(6, 0)$, $Q(-1, 8)$, and $R(-3, 2)$. What are the vertices of the image after the triangle is translated 2 units right and 6 units down?



13. $\triangle STU$ has vertices $S(-5, 1)$, $T(-7, -4)$, and $U(-2, -4)$. What are the vertices of the image after the triangle is translated 1 unit left and 6 units up?

