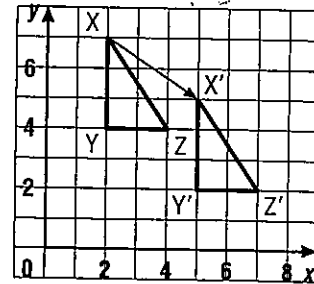


8.1 Translations

MATHPOWER™ *Nine*, pp. 300–302

A translation, or slide, is a motion that is described by length and direction.

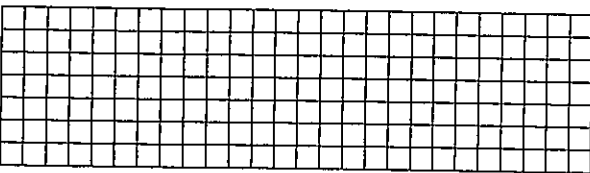
$\triangle XYZ$ has been translated 3 units right and 2 units down (3R, 2D). $\triangle X'Y'Z'$ is the translation image of $\triangle XYZ$. The translation can be described mathematically as the ordered pair $[3, -2]$ or as the following mapping. $(x, y) \rightarrow (x + 3, y - 2)$



The lengths of line segments and the sizes of angles do not change in a translation. The original figure and its image have the same sense.

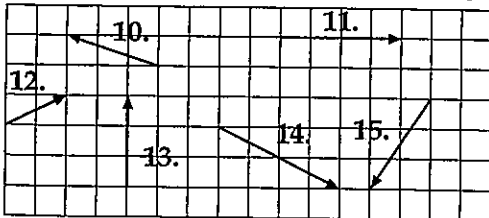
Draw an arrow on the grid to show each translation.

1. $[4, 1]$
2. $(x, y) \rightarrow (x - 2, y + 1)$
3. 3 units right
4. $[0, -2]$
5. 5 units left
6. $(x, y) \rightarrow (x + 1, y)$
7. $[2, 2]$
8. $(x, y) \rightarrow (x - 3, y - 1)$
9. 2 units right, 2 units down



For questions 10–15, refer to the grid to

- a) describe each translation in words
- b) write the ordered pair that describes each translation
- c) write each translation as a mapping



10. a) _____
b) _____ c) _____
11. a) _____
b) _____ c) _____
12. a) _____
b) _____ c) _____
13. a) _____
b) _____ c) _____

14. a) _____
b) _____ c) _____
15. a) _____
b) _____ c) _____

Complete the table.

	Original Point	Translation	Image Point
16.	$(2, -3)$	$(x, y) \rightarrow (x, y - 2)$	
17.	$(1, 0)$	4 units up	
18.	$(-5, 0)$	$(x, y) \rightarrow (x - 2, y + 3)$	
19.	$(-3, 4)$	$[3, 0]$	

Complete the table.

	Original Point	Image Point	Translation
20.	$(4, 2)$	$(-1, -3)$	
21.	$(5, -3)$	$(5, -5)$	
22.	$(-3, -2)$	$(-3, 1)$	
23.	$(0, 0)$	$(-1, 3)$	

24. $\triangle ABC$ has vertices $A(2, 2)$, $B(4, 2)$, and $C(5, 5)$. Draw $\triangle ABC$ on the grid.

Draw and label each translation image.

- a) $[-4, -3]$
- b) $(x, y) \rightarrow (x, y - 3)$

