TEKS 2A.4.B

LESSON 1-8

Exploring Transformations

Know it! Note

Lesson Objectives (p. 59):

Vocabulary

1. Transformation (p. 59): _____

2. Translation (p. 59): _____

3. Reflection (p. 60): _____

4. Stretch (p. 61): _____

5. Compression (p. 61): _____

Key Concepts

6. Translations (p. 59):

HORIZONTAL TRANSLATION	VERTICAL TRANSLATION

TEKS 2A.4.B

LESSON 1-8

Exploring Transformations

Know it! Note

Lesson Objectives (p. 59):

apply transformations to points and sets of points.

Vocabulary

1. Transformation (p. 59): a change in the position, size, or shape of a figure.

2. Translation (p. 59): a transformation that moves each point in a figure the same distance in the same direction.

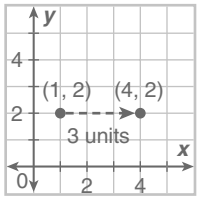
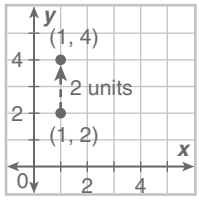
3. Reflection (p. 60): a transformation that flips a figure across a line called the line of reflection.

4. Stretch (p. 61): a transformation that pulls points away from the *x*-axis or *y*-axis.

5. Compression (p. 61): a transformation that pushes points toward the *x*-axis or *y*-axis.

Key Concepts

6. Translations (p. 59):

HORIZONTAL TRANSLATION		VERTICAL TRANSLATION	
Each point shifts right or left by a number of units.		**Each point shifts up or down by a number of units.**	
	**The *x*-coordinate changes.** **$(1, 2) \rightarrow (1 + 3, 2)$** **$(x, y) \rightarrow (x + h, y)$**		**The *y*-coordinate changes.** **$(1, 2) \rightarrow (1, 2 + 2)$** **$(x, y) \rightarrow (x, y + k)$**
left if $h < 0$	**right if $h > 0$**	**down if $k < 0$**	**up if $k > 0$**

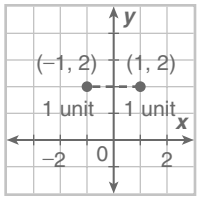
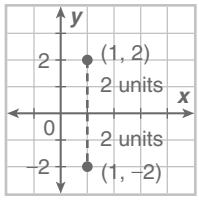
7. Reflections (p. 60):

REFLECTION ACROSS *y*-axis	REFLECTION ACROSS *x*-axis

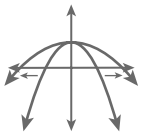
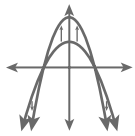
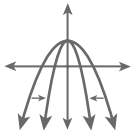
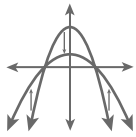
8. Stretches and Compressions (p. 61):

	HORIZONTAL	VERTICAL
STRETCH		
COMPRESSION		

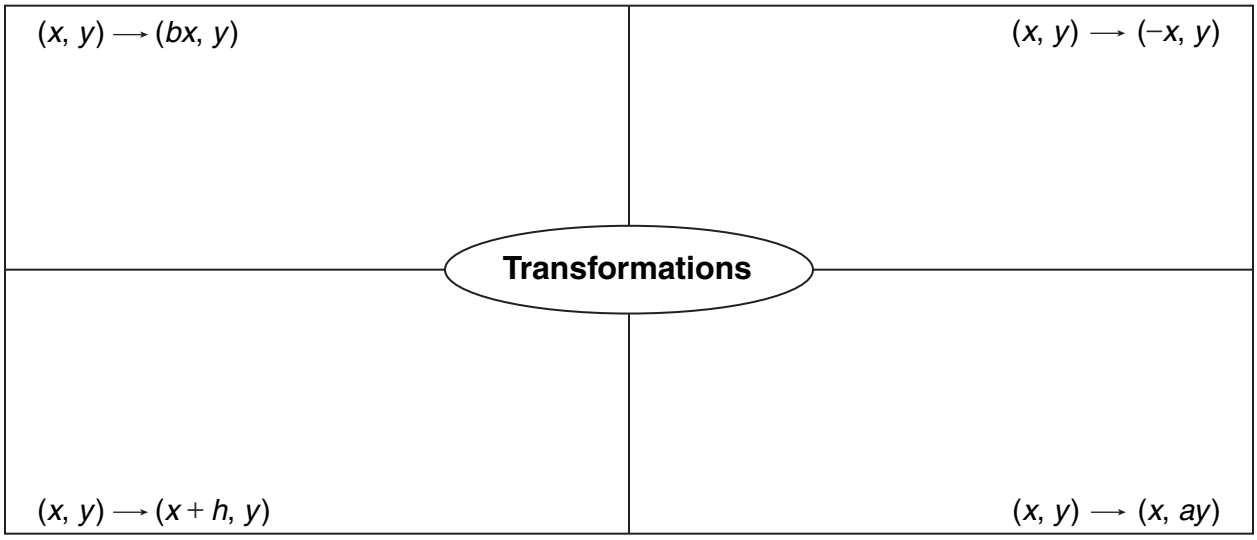
7. Reflections (p. 60):

REFLECTION ACROSS *y*-axis	**REFLECTION ACROSS *x*-axis**
Each point flips across the *y*-axis.  **The *x*-coordinate changes.** **$(1, 2) \rightarrow (-1, 2)$** **$(x, y) \rightarrow (-x, y)$**	**Each point flips across the *x*-axis.**  **The *y*-coordinate changes.** **$(1, 2) \rightarrow (1, -2)$** **$(x, y) \rightarrow (x, -y)$**

8. Stretches and Compressions (p. 61):

	HORIZONTAL	**VERTICAL**
STRETCH	**Each point is pulled away from the *y*-axis.**  **The *x*-coordinate changes.** **$(4, 0) \rightarrow (2(4), 0)$** **$(x, y) \rightarrow (bx, y)$** **$\lvert b \rvert > 1$**	**Each point is pulled away from the *x*-axis.**  **The *y*-coordinate changes.** **$(0, 4) \rightarrow (0, 2(4))$** **$(x, y) \rightarrow (x, ay)$** **$\lvert a \rvert > 1$**
COMPRESSION	**Each point is pushed away from the *y*-axis.**  **The *x*-coordinate changes.** **$(4, 0) \rightarrow (\frac{1}{2}(4), 0)$** **$(x, y) \rightarrow (bx, y)$** **$0 < \lvert b \rvert < 1$**	**Each point is pushed toward the *x*-axis.**  **The *y*-coordinate changes.** **$(0, 4) \rightarrow (0, \frac{1}{2}(4))$** **$(x, y) \rightarrow (x, ay)$** **$0 < \lvert a \rvert < 1$**

9. Get Organized In each box, describe the transformations indicated by each rule. (p. 62).



9. Get Organized In each box, describe the transformations indicated by each rule. (p. 62).

Transformations

$(x, y) \longrightarrow (bx, y)$

horizontal stretch or compression by a factor of b (stretch if $|b| > 1$ and compression if $0 < |b| < 1$)

$(x, y) \longrightarrow (-x, y)$

reflection across y-axis

horizontal translation by h units (left if $h < 0$ and right if $h > 0$)

$(x, y) \longrightarrow (x + h, y)$

vertical stretch or compression by a factor of a (stretch if $|a| > 1$ and compression if $0 < |a| < 1$)

$(x, y) \longrightarrow (x, ay)$