Translations

Essential Skill: Demonstrate Understanding of Concept

Transformations and Reflections

**Translations**

- A transformation in which each point of a figure moves the same distance in the same direction. (slide)

Describe the translation from the solid figure to the dashed figure in words.

- down 2, right 4

You can also write the translation using coordinate notation:

\[(x, y) \rightarrow (x - 3, y + 1)\]

Write the translation using coordinate notation:

\[(x+4, y-2)\]
Draw \( \triangle ABC \) with vertices \( A(3, -4) \), \( B(3, 0) \), and \( C(5, 2) \). Then find the coordinates of the vertices of the image after the translation \( (x, y) \rightarrow (x - 6, y + 2) \), and draw the image.

**Reflection**
- A transformation in which a figure is reflected, or flipped, in a line, called the line of reflection.

**Line of reflection**
- the line the reflection is flipped over

Tell whether the transformation is a reflection. If so, identify the line of reflection.

What do you notice about the \( x \)-values and \( y \)-values when something is reflected over the \( x \)-axis?

What do you notice about the \( x \)-values and \( y \)-values when something is reflected over the \( y \)-axis?
Draw \(\triangle ABC\) with vertices \(A(1, -1)\), \(B(3, 2)\), and \(C(4, -3)\). Then find the coordinates of the vertices of the image after a reflection in the \(y\)-axis, and draw the image.

**Line of Symmetry**

A figure has line symmetry if a line, called the line of symmetry, divides the figure into two parts that are reflections of each other in the line.

Determine how many lines of symmetry each figure has and then draw them.

**Demonstrate Understanding:**

Write each translation from the blue figure to the red figure in words and using coordinate notation.

1.) Right 4, down 3
\((x+4, y-3)\)

2.) Left 6, down 4
\((x-6, y-4)\)

3.) Draw quadrilateral JKLM with vertices \(J(-5, 0)\), \(K(-2, 0)\), \(L(3, -4)\) and \(M(-2, -4)\). Then find the coordinates of the vertices of the image after the translation \((x, y) \rightarrow (x+7, y+4)\), and draw the image.
4.) Draw $\triangle ABC$ with vertices $A(-1, 3)$, $B(2, 4)$, and $C(4, 1)$. Then find the coordinates of the vertices of the image after a reflection in the x-axis, and draw the image.

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A'(-1, -3)
B'(2, -4)
C'(4, -1)
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Determine how many lines of symmetry each figure has and then draw them.

5.) 

6.)

7.) None