A transformation is __when you manipulate a shape__

In Geometry there are four types of transformations: 1) __Translation__ 2) __Rotation__

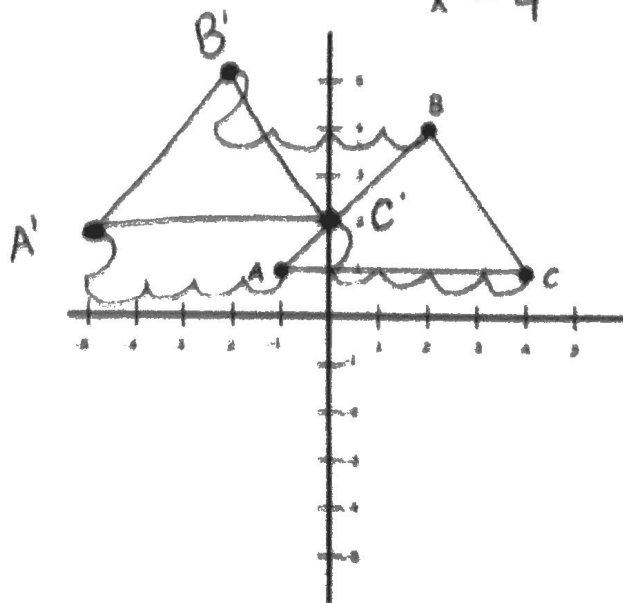3) __Reflection__ 4) __Dilation__

__Translation__ - when you slide an object

doesnt change size or direction

Given △ABC with A(-1, 1), B(2, 4), and C(4, 1). Translate △ABC left 4 units and up 1 unit.   y + 1

$\llcorner$ x - 4

a) Graph:

move each point

individually.

starting A (-1, 1)

B ~~////~~ (2, 4)

C (4, 1)

NEW: A' (-5, 2)

B' (-2, 5)

C' (0, 2)

b) Vertex matrix:

$$\begin{array}{c} x \\ y \end{array} \begin{bmatrix} -1 & 2 & 4 \\ 1 & 4 & 1 \end{bmatrix} \begin{array}{c} \\ \end{array}$$

A   B   C

$\xrightarrow[\text{y + 1}]{\text{x - 4}}$

$$\begin{bmatrix} -5 & -2 & 0 \\ 2 & 5 & 2 \end{bmatrix}$$

A'   B'   C'

c) Algebraic (arrow) rule:

$$(x, y) \rightarrow (x-4, y+1)$$

$$x+2 \qquad y-3$$

Ex. 1) Using $\triangle ABC$ on the front of this sheet, we want to translate $\triangle ABC$ <u>right 2 units</u> and <u>down 3</u> units. Let's call our translated triangle, $\triangle A''B''C''$.

~~a)~~ Draw the graph of $\triangle A''B''C''$ on the same set of axes on the front of this sheet.

b) What would be the vertex matrix of the original triangle, and the translated triangle?

$$\begin{bmatrix} -1 & 2 & 4 \\ 1 & 4 & 1 \\ A & B & C \end{bmatrix} \xrightarrow[y-3]{x+2} \begin{bmatrix} 1 & 4 & 6 \\ -2 & 1 & -2 \\ A' & B' & C' \end{bmatrix}$$

c) What would be the algebraic (arrow) rule for this translation?

$$(x, y) \rightarrow (x+2, y-3)$$

Ruler

move up — $y+$

move down — $y-$

move left — $x-$

move right — $x+$