Notes on Transformations

Types of Transformations
Reflections – flip
Rotations - spin
Translations - slide
Dilations – change size

Which transformations will make the shape keep the same exact size?
Reflections, Rotations and Translations

Which transformations will keep the same orientation?
Translations and Dilations

Which transformations will keep the angles of the pre-image equal to the angles of the image?
ALL OF THEM! Only the dilation will have longer or shorter sides, but they will keep the same angle in every figure.
Rules for Reflection

Reflecting over the x-axis – When reflecting over the x-axis; keep the x sign the same and change the sign of the y. \((x, y) \rightarrow (x, -y)\)

Reflecting over the y-axis – When reflecting over the y-axis; keep the y sign the same and change the sign of the x. \((x, y) \rightarrow (-x, y)\)

Reflecting over \(y = x\) – When reflecting over the line \(y = x\); you just switch the x value to the y value and the y value to the x value. Just swap places with x and y. \((x, y) \rightarrow (y, x)\)

Reflecting over a given line \(y = \) or \(x =\) When reflecting over a line other than the axis. Put a point on the axis that matches what the lines equation states. Ex. \(y = 3\); you would place a point at 3 on the y-axis. The lines \(y =\) and \(x =\) are horizontal and vertical lines, but they are not the axis. Once you put the point at \(y = 3\) you will note that a vertical line and a horizontal line can be drawn through the point, you do not want the axis, so you draw the other line. You reflect over this line. Reflect by moving each vertex point over the reflection line the same amount of spaces.

See Homework Section (9/7/16) of my homepage for a list of helpful sites to see for practice with Reflections.
Rules for Rotations

_Rotating 90 degrees or 270 degrees_ – When rotating either 90 or 270 degrees the x and y values will change places so that the original y value is now the x value and the original x value is now the y value. The signs of these will be determined by which quadrant they end up in.

Quadrant I – (positive, positive)
Quadrant II – (negative, positive)
Quadrant III – (negative, negative)
Quadrant IV – (positive, negative)

_Rotating 180 degrees_ – When rotating 180 degrees the x and the y value stay in the same location, but both of them change signs.

\[(x, y) \rightarrow (-x, -y)\]

Clockwise is spinning to the right (same direction as the numbers increase on a clock)
Counterclockwise is spinning to the left

_Similarities between reflecting over an axis and rotating 180 degrees_ - Both will keep the x and the y values in their original spot.

_Differences between reflecting over an axis and rotating 180 degrees_ – Reflecting will make only one sign change, either x or y, but not both. Rotating 180 degrees will cause both signs to change, both x and y.

See my homepage (9/13/16) for helpful sites about Rotations