Rotations

Counter Clockwise:
90 degrees: (x,y)-->(-y,x)
180 degrees: (x,y)-->(-x,-y)
270 degrees: (x,y)-->(y,-x)
360 degrees: (x,y)-->(x,y), no changes

Clockwise:
270 degrees: (x,y)-->(-x,y)
180 degrees: (x,y)-->(-x,-y)
90 degrees: (x,y)--> (y,-x)
360 degrees: (x,y)-->(x,y), no changes

Translations

Translations are **isometry**, meaning the image and pre-image (the original image) are congruent, or the same. Translations in the coordinate plane can be described by the mapping notation (x,y)-->(x+a, y+b), if you have negative numbers you would switch the signs.

Because 'a' corresponds to the x-axis, you would move 'a' units horizontally, 'b' corresponds to the y-axis, so you would move 'b' units vertically.

Example: (3,7)-->(3+8, 7-6)-->(1-1,1). (3,7) would be a point on your pre-image/original point, and (11,1) would be your image.

Reflections

A reflection is when you reflect something across the y-axis or the x-axis. When you reflect a point or figure over the x-axis the new point will go from (x,y)-->(x,-y)
the sign of the y-coordinate will change to its opposite. When you reflect a point over the y-axis, the point will change from (x,y)-->(-x,y). The sign of the x coordinate will change to it's opposite.

DIlations

A dilation is when a figure shrinks or is enlarged by something called a **scale factor**. A scale factor is the number of times a figure is enlarged or shrunken. A scale factor can be a whole number or a fraction/-decimal, but *cannot* be a negative number. A scale factor greater than 1 is an enlargement, and a scale factor *less* than 1 shrinks it.

Ex: a figure (the pre-image) has points A(7,8), B(6,2), C(10,12), D(16,20) with a scale factor of 2. This means you will multiply every point by 2. The image would now be A'(14,16), B'(12,4), C'(20,24), D'(32,40). The ' means prime, and is used to show that this is not the pre-image, and is instead the new image.

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