

TRANSFORMATIONS CHEAT-SHEET!

REFLECTIONS:

- ✓ Reflections are a flip.
- ✓ The flip is performed over the “line of reflection.” Lines of symmetry are examples of lines of reflection.
- ✓ Reflections are isometric, but do not preserve orientation.

Coordinate plane rules:

Over the x-axis: $(x, y) \rightarrow (x, -y)$

Over the y-axis: $(x, y) \rightarrow (-x, y)$

Over the line $y = x$: $(x, y) \rightarrow (y, x)$

Through the origin: $(x, y) \rightarrow (-x, -y)$

TRANSLATIONS:

- ✓ Translations are a slide or shift.
- ✓ Translations can be achieved by performing two composite reflections over parallel lines.
- ✓ Translations are isometric, and preserve orientation.

Coordinate plane rules:

$(x, y) \rightarrow (x \pm h, y \pm k)$ where h and k are the horizontal and vertical shifts.

Note: If movement is left, then h is negative. If movement is down, then k is negative.

DILATIONS:

- ✓ Dilations are an enlargement / shrinking.
- ✓ Dilations multiply the distance from the point of projection (point of dilation) by the scale factor.
- ✓ Dilations are not isometric, and preserve orientation only if the scale factor is positive.

Coordinate plane rules:

From the origin dilated by a factor of “ c ”: $(x, y) \rightarrow (cx, cy)$

From non-origin by factor of “ c ”: count slope from point to projection point, multiply by “ c ,” count from projection point.

ROTATIONS:

- ✓ Rotations are a turn.
- ✓ Rotations can be achieved by performing two composite reflections over intersecting lines. The resulting rotation will be double the amount of the angle formed by the intersecting lines.
- ✓ Rotations are isometric, and do not preserve orientation unless the rotation is 360° or exhibit rotational symmetry back onto itself.
- ✓ Rotations of 180° are equivalent to a reflection through the origin.

Coordinate plane rules:

Counter-clockwise:	Clockwise:	Rule:
90°	270°	$(x, y) \rightarrow (-y, x)$
180°	180°	$(x, y) \rightarrow (-x, -y)$
270°	90°	$(x, y) \rightarrow (y, -x)$