

Rotations Def: Every point of preimage is moved by a given angle about a point.

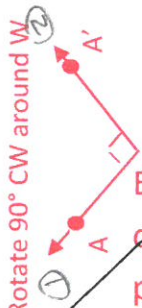
Not Rigid Motion

Rigid Motion

Not Rigid Motion

Drawing Method:

- 1) Ray to connect center to vertex
- 2) Angle using ray and direction (CW or CCW) given
- 3) Distance using compass to copy along 2nd ray of angle to place image point.
- 4) Repeat for all vertices and then connect to form figure



Every point of preimage changes location based on a point (center of dilation) and size based on a scale factor

Drawing Method:

- 1) $+n \rightarrow$ draw ray through center and vertex
 $-n \rightarrow$ draw ray through center and vertex and the opposite direction
- 2) Measure and scale distance between center and vertex.
- 3) Place image the corresponding distance from center in same direction if $+n$ or opp. Direction if $-n$ (can use compass for integer multipliers)

Coordinate Method:

$$(x,y) \rightarrow (nx,ny)$$

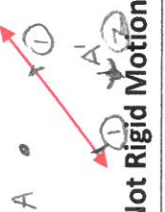
Transformations

Def:

Every point of preimage may be connected to its image by a segment that (a) is \perp to line of reflection and (b) has a midpoint on the line of reflection

Drawing Method:

- 1) Draw 2 arcs from point to reflect through line of reflection.
 - 2) Draw 2 arcs from those intersections to other side of line of reflection.
 - 3) Place image at intersection of 2nd set of arcs
- EX Reflect A across line m



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Coordinate Method:

- 1) 90° CW around $(0,0)$: 270° CCW to $(x,y) \rightarrow (y, -x)$
 - 2) 180° around $(0,0)$: $(x,y) \rightarrow (-x, -y)$
 - 3) 270° around $(0,0)$: $(x,y) \rightarrow (-y, x)$
- Also 90° CCCW

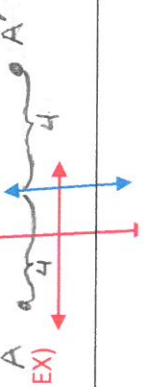
Every point of preimage moves the same amount in the same direction.

Drawing Method:

- 1) Draw a ray parallel to translation vector at each vertex.
- 2) Mark off a distance equal to translation vector on each ray and label with image point A', B', etc.
- 3) Combination moves are possible.

Coordinate Method:

- 1) x-axis: $(x,y) \rightarrow (x, -y)$
- 2) y-axis: $(x,y) \rightarrow (-x, y)$
- 3) across $y = x$: $(x,y) \rightarrow (y, x)$
- 4) across $y = -x$: $(x,y) \rightarrow (-y, -x)$
- 5) other horizontal ($y = a$) and verticals ($x = a$): count distance to line and mirror that on the other side.



Reflections

Rigid Motion

Dilations

Translations

Not Rigid Motion