

Curriculum Outcomes

(SS3) Demonstrate an understanding of similarity of polygons.

(SS4) Draw and interpret scale diagrams of 2-D shapes.

(SS5) Demonstrate an understanding of line and rotation symmetry.

Student Friendly: Rotating shapes a certain degrees, about specific point.

Apr 20-8:21 AM

Warm Up

Reflect the following shape across the line $x = 2$
 WRITE THE COORDINATES for each vertex.

The diagram shows a coordinate plane with a grid. A vertical line is drawn at $x = 2$. To the left of this line is a green pentagon with vertices labeled A, B, C, D, E, and F. To the right of the line is a purple pentagon, which is a reflection of the green one, with vertices labeled A', B', C', D', E', and F'. The x-axis and y-axis are shown with arrows at their ends.

Apr 18-1:10 PM

Section 7.6

Rotations & Rotational Symmetry

The images include a black and white line drawing of a pinwheel, a photograph of a wooden windmill with a white base, a red pinwheel with many thin blades, and a blue geometric pattern composed of several triangles arranged in a star-like shape.

Apr 12-7:45 PM

Lets rotate this object about its center

On your copy draw the rotated

This is a line segment to help indicate the angle the shape turned.

Rotate 90°

Rotate 180°

Rotate 270°

Rotate 360°

Which pictures look like the original?

Apr 12-7:55 PM

Lets rotate this object about its center On your copy draw the rotated figure

Rotate 90°

Rotate 180°

Rotate 270°

Rotate 360°

Which pictures look like the original?

How many ??? 2

coincides: looks the same as the original

LOOK AT THE NEXT SLIDE THEN COME BACK TO THIS

This object has Rotational symmetry of order 2.

Angle of Rotaional Symmetry $\frac{360^\circ}{\text{the order of rotation}}$

$$= \frac{360^\circ}{2}$$

$$= 180^\circ$$

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Rotations

A shape has **rotational symmetry** when it coincides with itself after a rotation of 360° about its centre.



Order of Rotation is the number of times a shape coincides with itself during a 360° rotation

How to state this?

rotational symmetry of order

Angle of Rotational Symmetry $\frac{360^\circ}{\text{the order of rotation}}$

Note:

A shape that requires a rotation of 360° to return to its original shape does not have a rotational symmetry. A shape cannot have a rotational symmetry of 1.

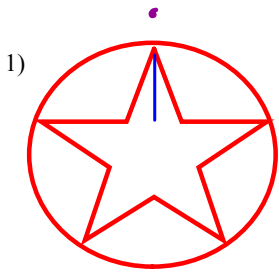
Look at the web book video in rotations

www.mathmakessense.ca



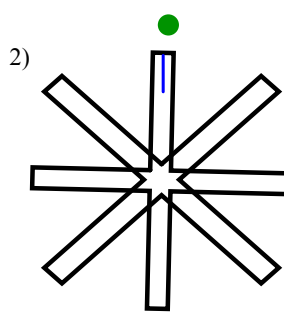
Apr 12-8:27 PM

Determine if the following shapes have rotational symmetry. If so state the order of rotation and the angle of rotational symmetry.



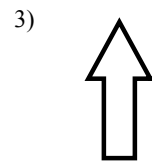
order = 5

$$\angle \text{rot} = \frac{360}{5} = 72^\circ$$



order = 8

$$\angle \text{rot} = \frac{360}{8} = 45^\circ$$



Apr 12-9:01 PM

Determine if the following shapes have rotational symmetry. If so state the order of rotation and the angle of rotational symmetry.

1) original

Rotational symmetry of order 5

Angle of rotation: $\frac{360^\circ}{5} = 72^\circ$

2)

Rotational symmetry of order 8


Angle of rotation: $\frac{360^\circ}{8} = 45^\circ$

3)

Is rotated one complete turn before it coincides. It **DOES NOT** have rotational symmetry.


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Rotational Directions




clockwise

Counter - Clock Wise Rotations



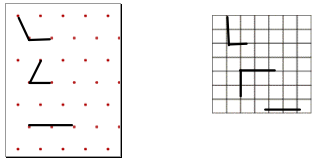
Earth turns counter-clockwise.



Rotations Are Transformations


Text book

- Grid paper will be used to illustrate rotations of 90° (or 180° or 270°)

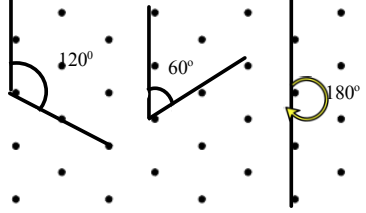
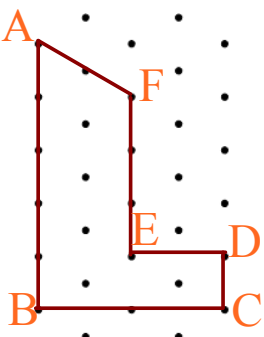


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Rotating Images



Rotate the image 180° clockwise about vertex B.
Draw the rotation image.
Pick a line connected from the vertex of interest



Apr 13-6:56 PM

Rotating Images

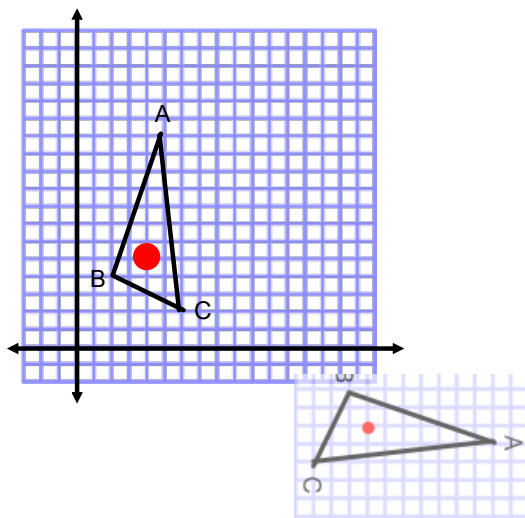
Rotate the image 180° clockwise about vertex B.
Draw the rotation image.

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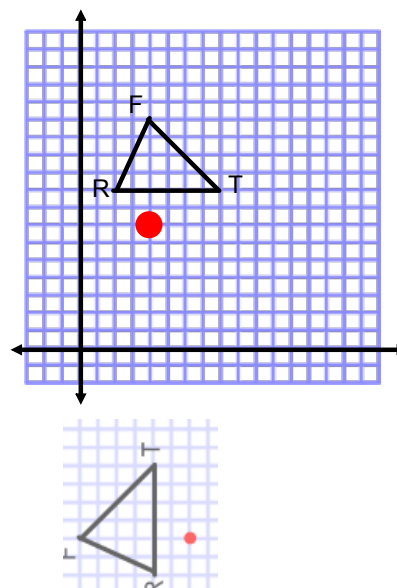
Draw and label the rotated image for each triangle. Label the center of rotation (given in the question)

Step 1) Trace the shape on your own paper and rotate that shape holding your finger or pencil at the rotation center.

1) Rotation 180° counterclockwise, center R(4, 5)



2) Rotation 90° counterclockwise, center R(4, 7)

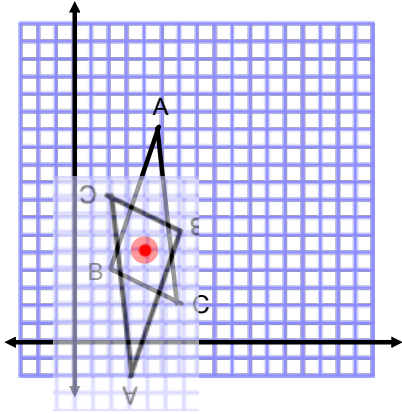


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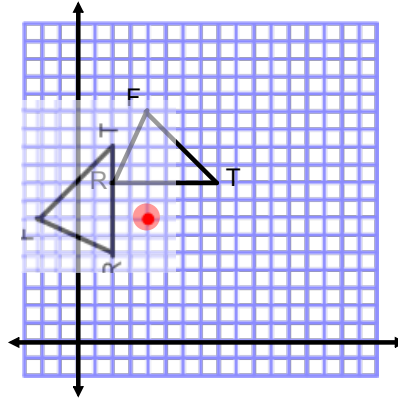
Draw and label the rotated image for each triangle. Label the center of rotation (given in the question)

Step 1) Trace the shape on your own paper and rotate that shape holding your finger or pencil at the rotation center.

1) Rotation 180° counterclockwise, center $R(4, 5)$



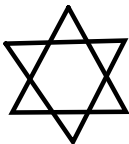
2) Rotation 90° counterclockwise, center $R(4, 7)$



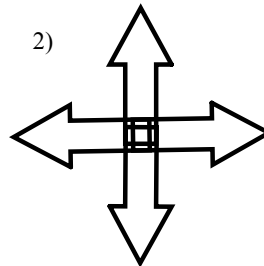
Apr 19-12:17 PM

Determine if the following shapes have rotational symmetry. If so, state the order of rotation and the angle of rotational symmetry.

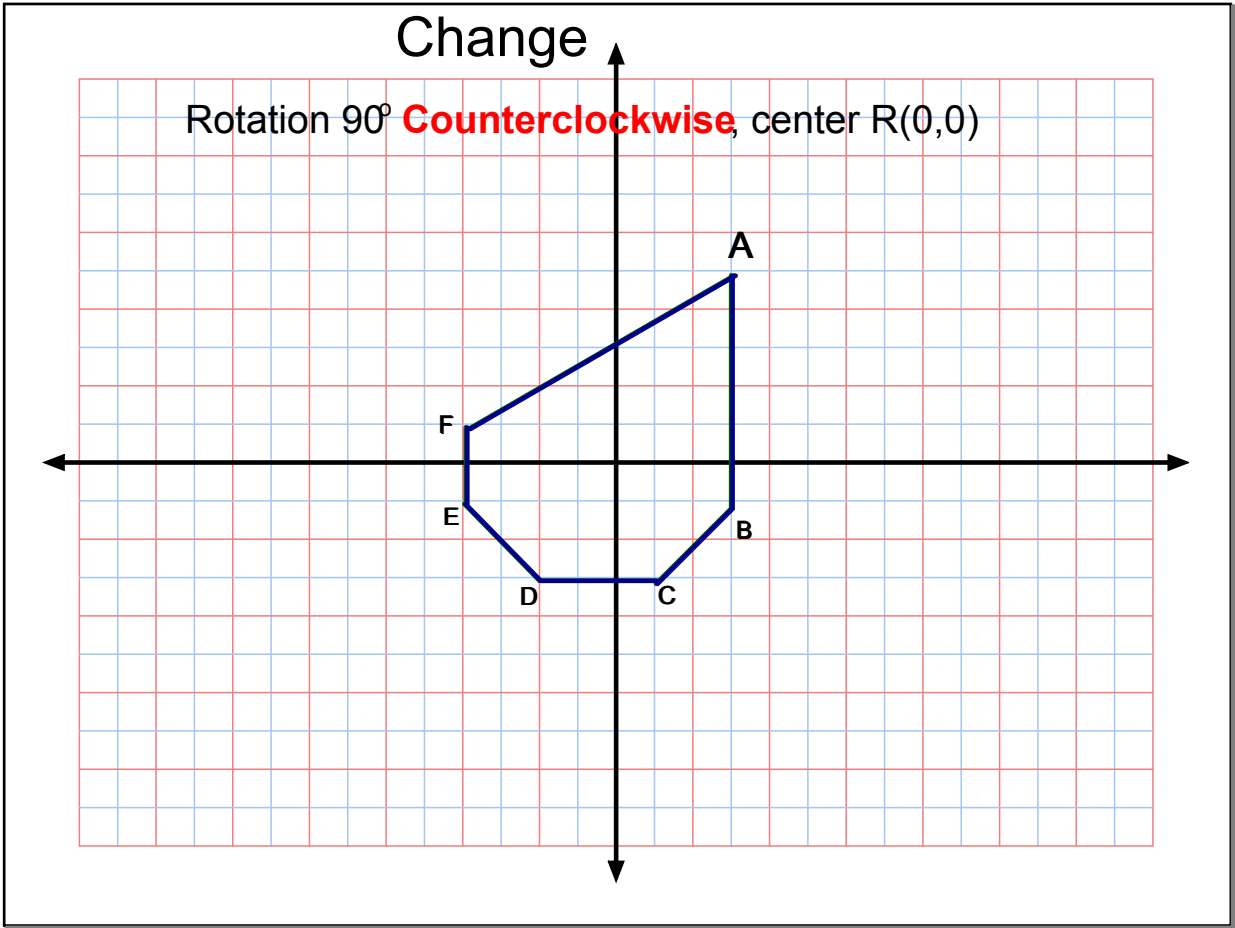
1)



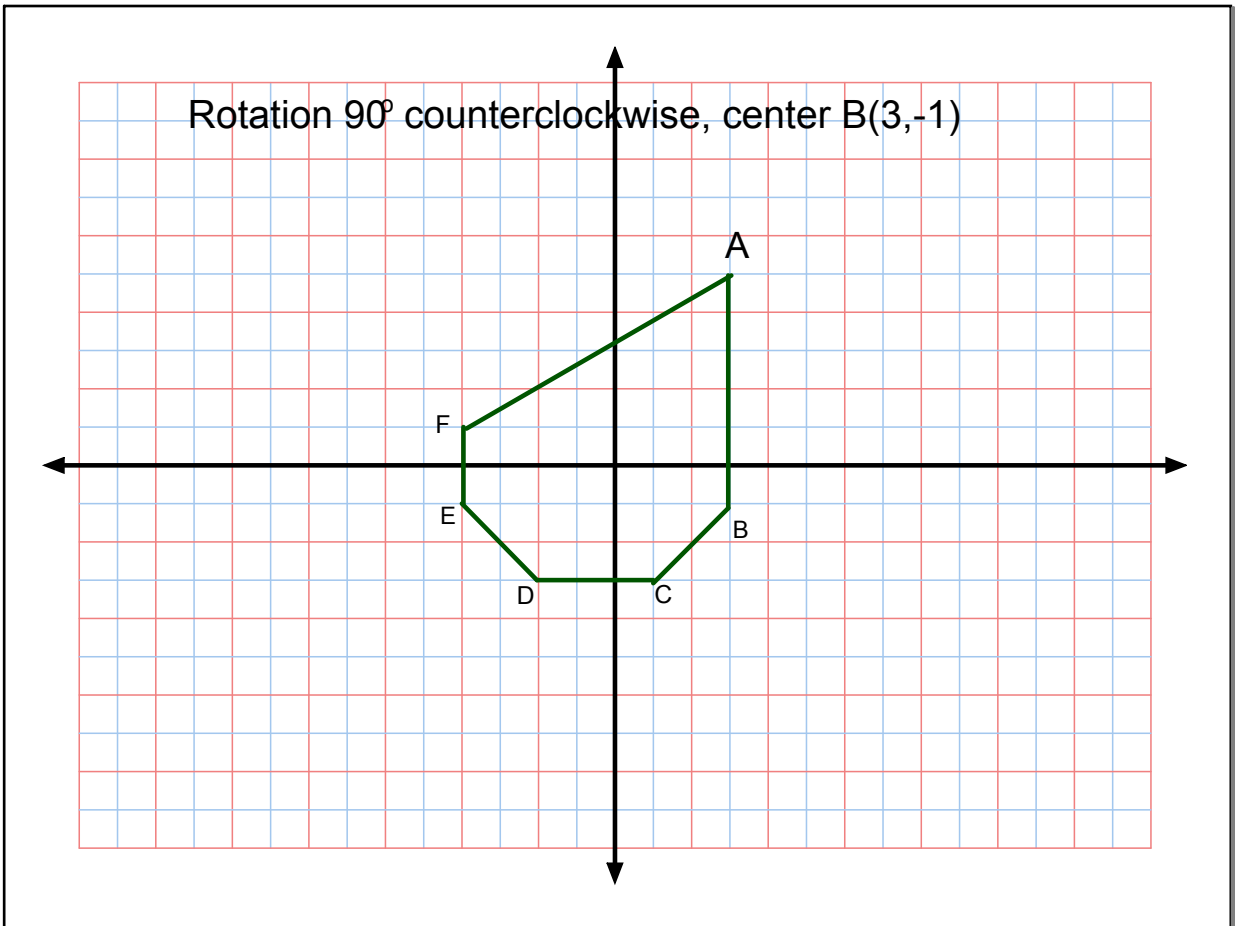
2)




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Apr 18-1:10 PM



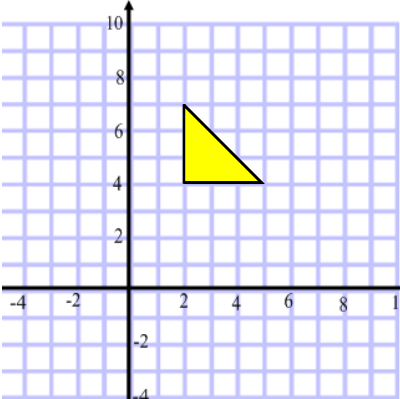
Translation



In Geometry, "Translation" simply means **Moving or Slide**

Every point of the shape must move:

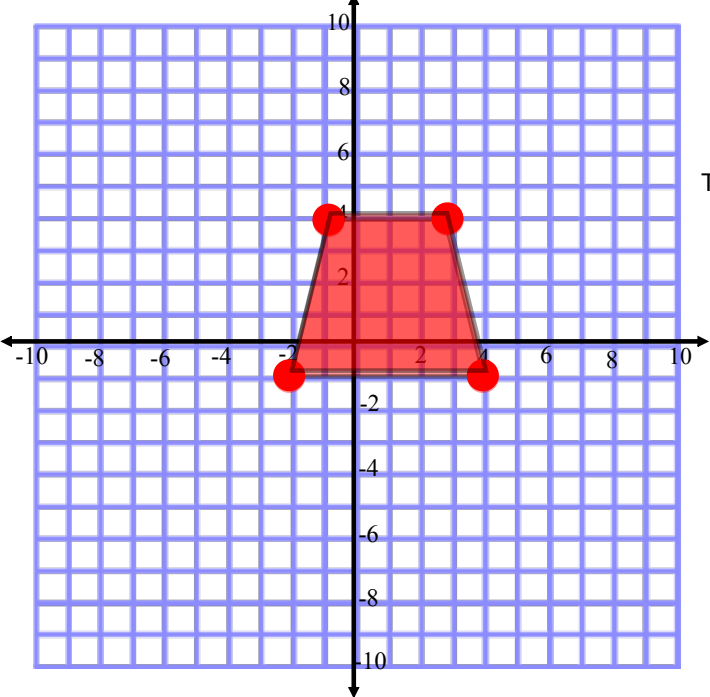
- the **same distance**
- in the **same direction.**



Translate the shape:
Left 3 units and 1 Unit Down

Notation:
L3 and 1D

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Translate the shape:
Right 3 units and 4 Unit Down

Notation:

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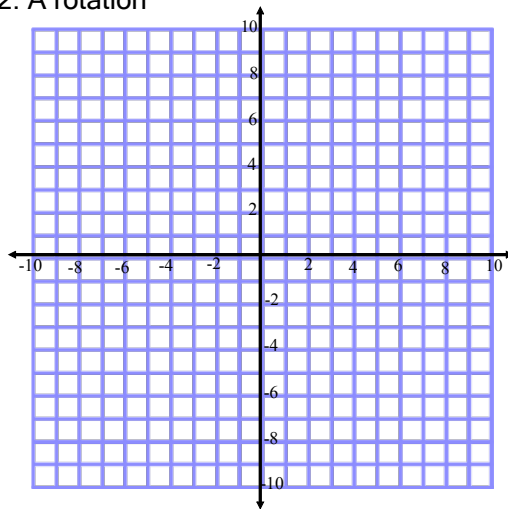
On grid paper plot the following points:

A (1, 3) B (3,1) and C (5,5)

Do the following Transformations:

1. A translation [slide] 2 units right and 2 units down of ABC.
of ABC 180 about vertex C

2. A rotation



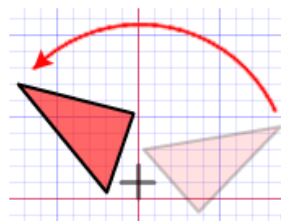
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There are three types of transformations:

1. reflections [Line of reflection]

- Reflect through x-axis
- Reflect through y-axis

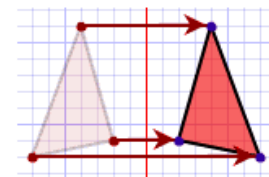
*oblique two coordinates



Turn!

2. rotations

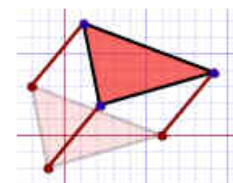
- order of rotation
- angle of rotation



Flip!

3. translations [slide]

Left 3 up 2 [L3U2]
right 4 down 2 [R4 D2]



Slide!

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Class/Homework

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Questions: 4, 5, 6, ~~7~~, 8

9, ~~10~~, 13, 14a, 15



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