



Rotating Around Axis

Name: _____

Rotate each shape. Answer with the new coordinates.

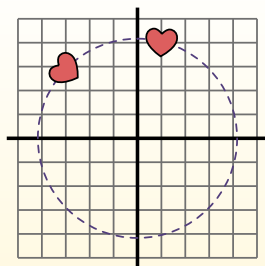
θ = Angle of Rotation

Rotation Formula

$$x1 = x \times \cos(\theta) - y \times \sin(\theta)$$

$$y1 = x \times \sin(\theta) + y \times \cos(\theta)$$

In the example to the right the shape is at coordinates (1,4). Lets find the coordinates if we rotated the shape 60°.



$$1. \quad x1 = 1 \times \cos(60) - 4 \times \sin(60)$$

$$y1 = 1 \times \sin(60) + 4 \times \cos(60)$$

$$2. \quad x1 = 1 \times 0.5 - 4 \times 0.87$$

$$y1 = 1 \times 0.87 + 4 \times 0.5$$

$$3. \quad x1 = 0.5 - 3.48$$

$$y1 = 0.87 + 2$$

$$4. \quad x1 = -2.98$$

$$y1 = 2.87$$

5. Looking at shape, we can see that rotated 60° it is at (-2.98 , 2.87).

Answers

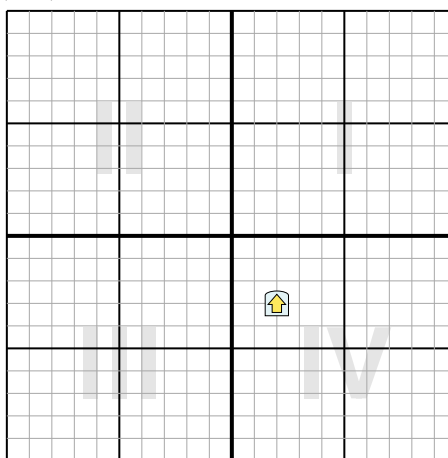
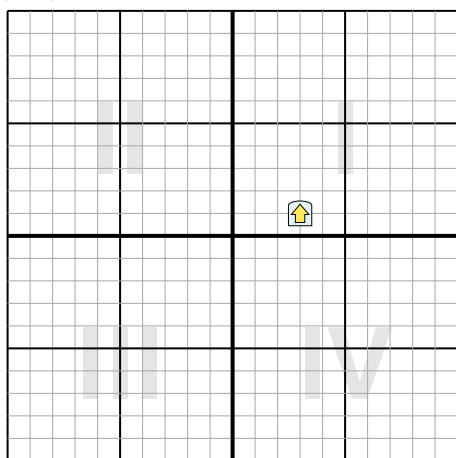
1. _____

2. _____

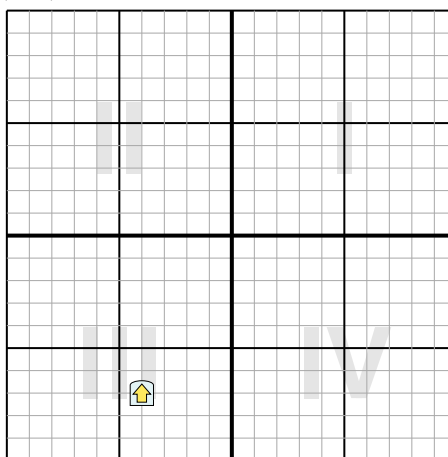
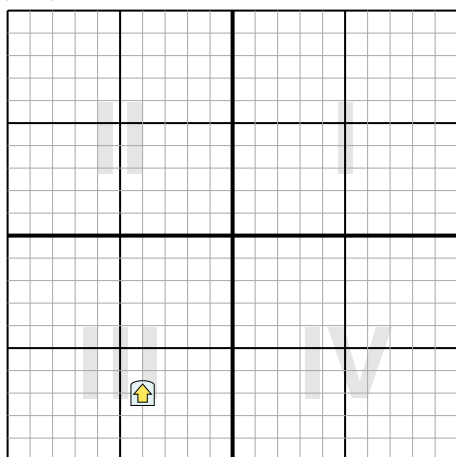
3. _____

4. _____

- 1) Rotate the shape -171° around the point (0,0). 2) Rotate the shape -280° around the point (0,0).



- 3) Rotate the shape -246° around the point (0,0). 4) Rotate the shape 184° around the point (0,0).

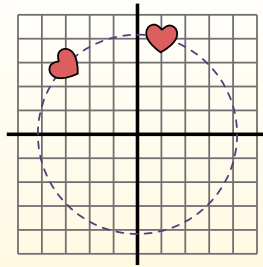


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$$y1 = x \sin(\theta) + y \cos(\theta)$$

In the example to the right the shape is at coordinates (1,4). Lets find the coordinates if we rotated the shape 60° .



1. $x1 = 1 \times \cos(60) - 4 \times \sin(60)$

$$y1 = 1 \times \sin(60) + 4 \times \cos(60)$$

2. $x1 = 1 \times 0.5 - 4 \times 0.87$

$$y1 = 1 \times 0.87 + 4 \times 0.5$$

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$$y1 = 0.87 + 2$$

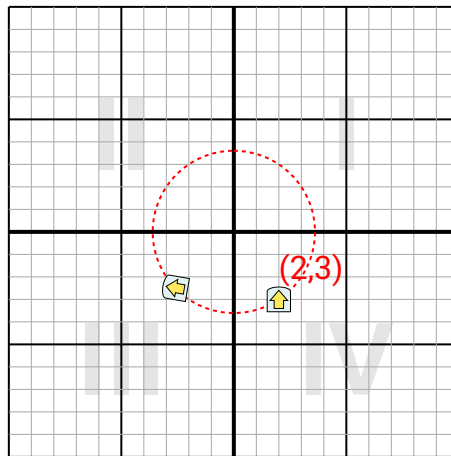
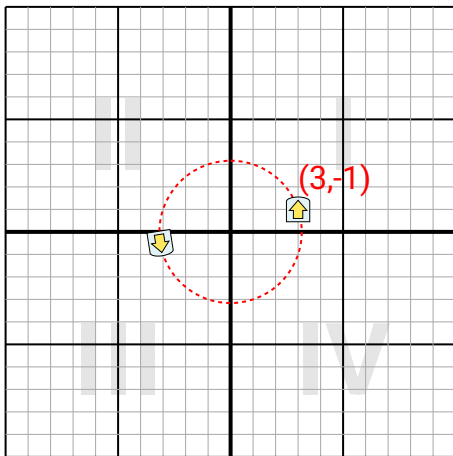
4. $x1 = -2.98$

$$y1 = 2.87$$

5. Looking at shape, we can see that rotated 60° it is at $(-2.98, 2.87)$.

Answers1. **$(-3.1, -0.5)$** 2. **$(-2.6, -2.5)$** 3. **$(-4.8, 6.5)$** 4. **$(4.5, 6.7)$**

- 1) Rotate the shape -171° around the point (0,0). 2) Rotate the shape -280° around the point (0,0).



- 3) Rotate the shape -246° around the point (0,0). 4) Rotate the shape 184° around the point (0,0).

