



Rotating Around Axis

Name: _____

Rotate each shape. Answer as the new coordinates.

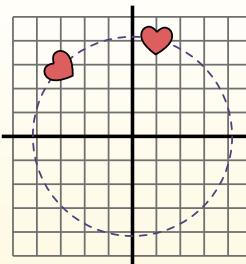
θ = Angle of Rotation

Rotation Formula

$$x_1 = x \cos(\theta) - y \sin(\theta)$$

$$y_1 = x \sin(\theta) + y \cos(\theta)$$

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



1. $x_1 = 1 \cos(60^\circ) - 4 \sin(60^\circ)$

$y_1 = 1 \sin(60^\circ) + 4 \cos(60^\circ)$

2. $x_1 = 1 \times 0.5 - 4 \times 0.87$

$y_1 = 1 \times 0.87 + 4 \times 0.5$

3. $x_1 = 0.5 - 3.48$

$y_1 = 0.87 + 2$

4. $x_1 = -2.98$

$y_1 = 2.87$

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

Answers

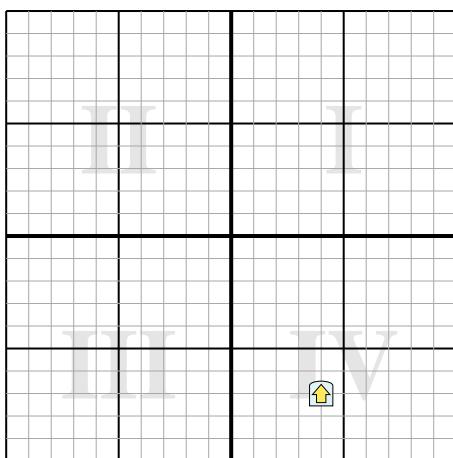
1. _____

2. _____

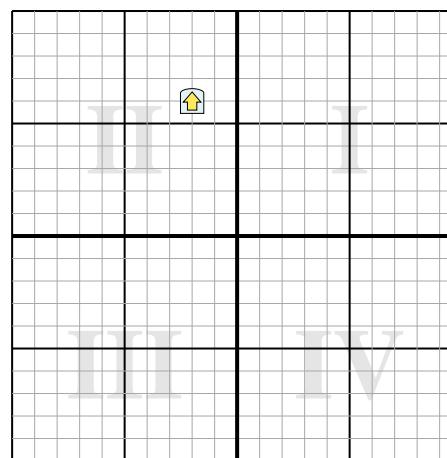
3. _____

4. _____

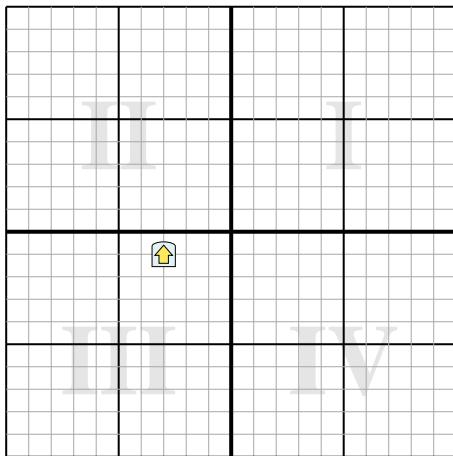
- 1) Rotate the shape -91° around the point (0,0).



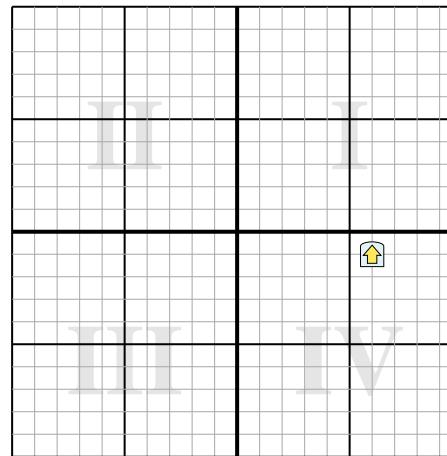
- 2) Rotate the shape -189° around the point (0,0).



- 3) Rotate the shape -140° around the point (0,0).



- 4) Rotate the shape 202° around the point (0,0).





Rotate each shape. Answer as the new coordinates.

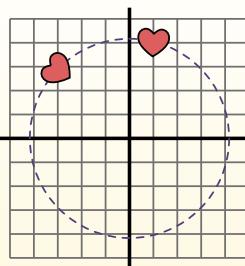
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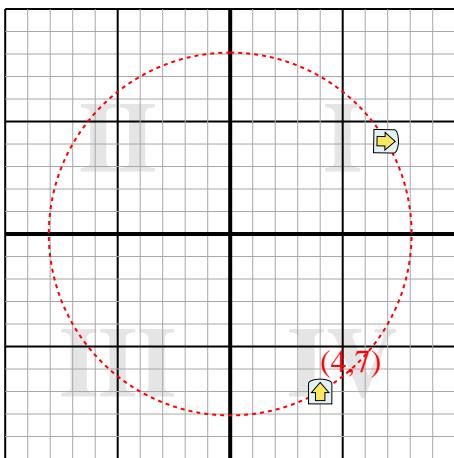


1. $x_1 = 1 \cos(60^\circ) - 4 \sin(60^\circ)$
 $y_1 = 1 \sin(60^\circ) + 4 \cos(60^\circ)$
2. $x_1 = 1 \times 0.5 - 4 \times 0.87$
 $y_1 = 1 \times 0.87 + 4 \times 0.5$
3. $x_1 = 0.5 - 3.48$
 $y_1 = 0.87 + 2$
4. $x_1 = -2.98$
 $y_1 = 2.87$
5. Looking at shape, we can see that rotated 60° it is at (-2.98, 2.87).

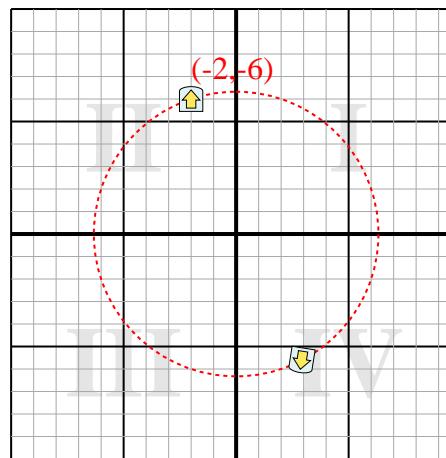
Answers

1. **(6.9,4.1)**
2. **(2.9,-5.6)**
3. **(2.9,-1.2)**
4. **(-5.2,3.2)**

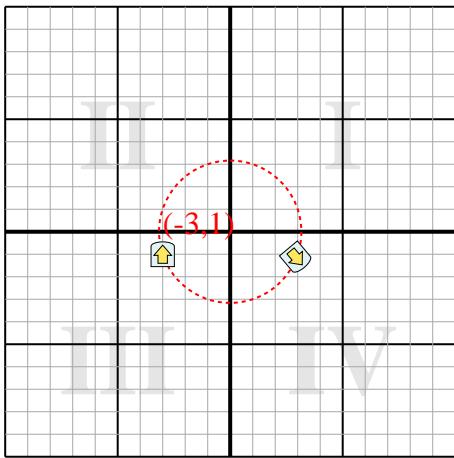
- 1) Rotate the shape -91° around the point (0,0).



- 2) Rotate the shape -189° around the point (0,0).



- 3) Rotate the shape -140° around the point (0,0).



- 4) Rotate the shape 202° around the point (0,0).

