



Rotating Around Axis

Name: _____

Rotate each shape. Answer as the new coordinates.

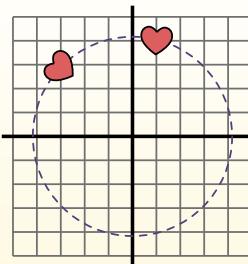
θ = Angle of Rotation

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° .

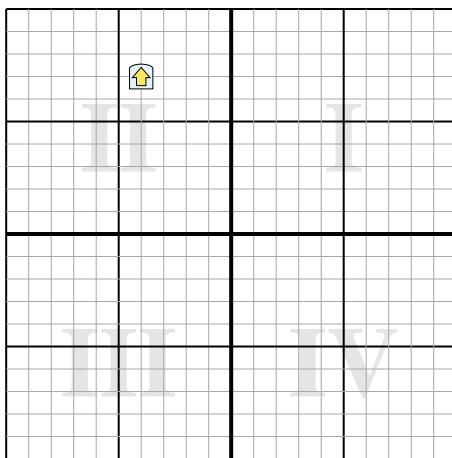


1. $x_1 = 1 \cos(60) - 4 \sin(60)$
 $y_1 = 1 \sin(60) + 4 \cos(60)$
2. $x_1 = 1 \times 0.5 - 4 \times 0.87$
 $y_1 = 1 \times 0.87 + 4 \times 0.5$
3. $x_1 = 0.5 - 3.48$
 $y_1 = 0.87 + 2$
4. $x_1 = -2.98$
 $y_1 = 2.87$
5. Looking at shape, we can see that rotated 60° it is at (-2.98, 2.87).

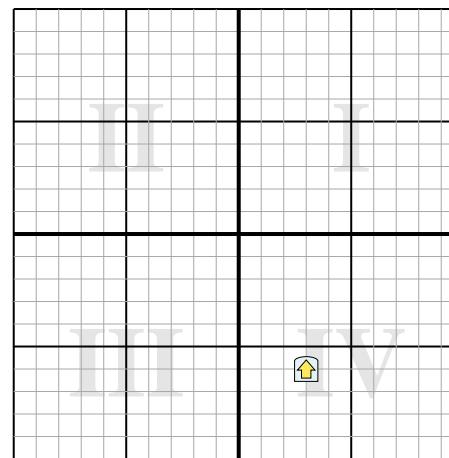
Answers

1. _____
2. _____
3. _____
4. _____

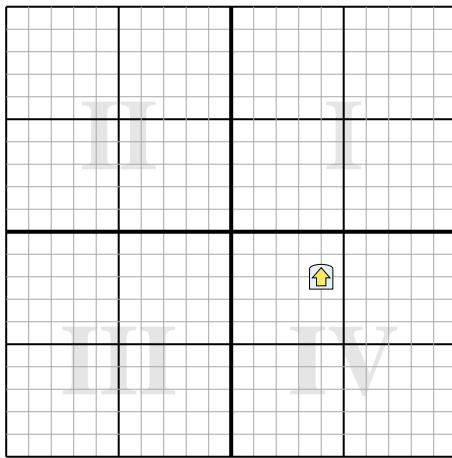
- 1) Rotate the shape 91° around the point (0,0).



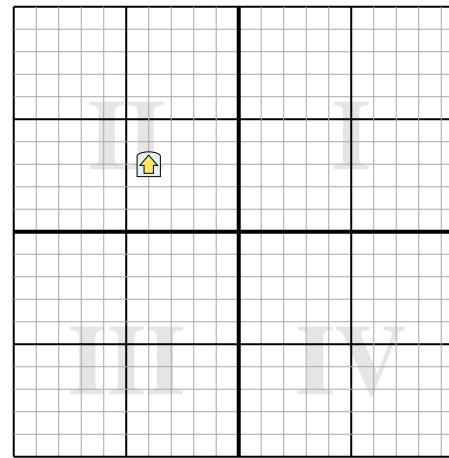
- 2) Rotate the shape -105° around the point (0,0).



- 3) Rotate the shape 248° around the point (0,0).



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





Rotate each shape. Answer as the new coordinates.

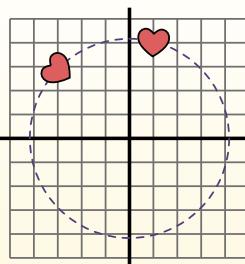
θ = Angle of Rotation

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

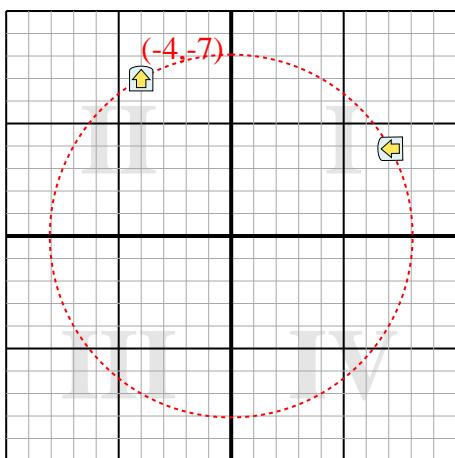
1. **(7,1,3,9)**

2. **(5,4,5)**

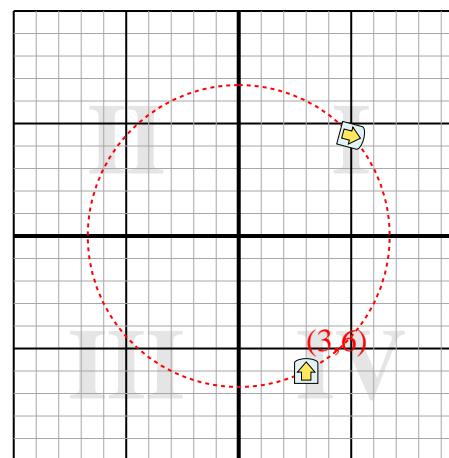
3. **(0,4,4,5)**

4. **(5,0,3)**

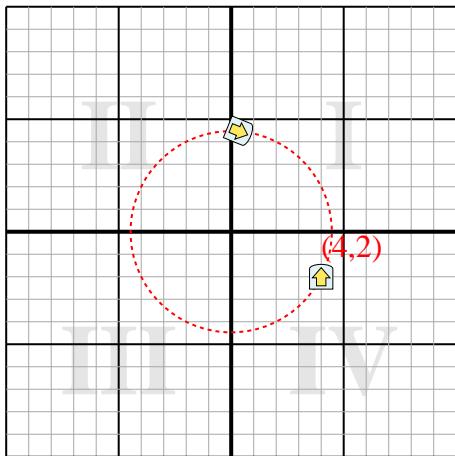
- 1) Rotate the shape 91° around the point $(0,0)$.



- 2) Rotate the shape -105° around the point $(0,0)$.



- 3) Rotate the shape 248° around the point $(0,0)$.



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

