



# Rotating Around Axis

Name: \_\_\_\_\_

**Rotate each shape. Answer as the new coordinates.**

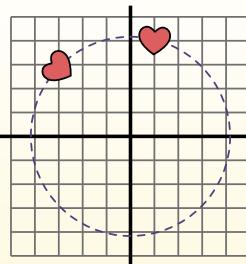
$\theta$  = Angle of Rotation

### 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  $60^\circ$ .

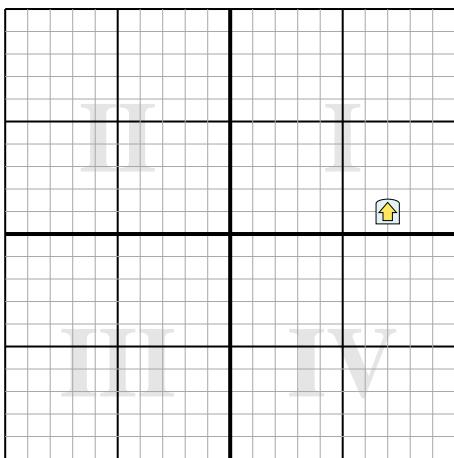


1.  $x_1 = 1 \cos(60^\circ) - 4 \sin(60^\circ)$   
 $y_1 = 1 \sin(60^\circ) + 4 \cos(60^\circ)$
2.  $x_1 = 1 \times 0.5 - 4 \times 0.87$   
 $y_1 = 1 \times 0.87 + 4 \times 0.5$
3.  $x_1 = 0.5 - 3.48$   
 $y_1 = 0.87 + 2$
4.  $x_1 = -2.98$   
 $y_1 = 2.87$
5. Looking at shape, we can see that rotated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

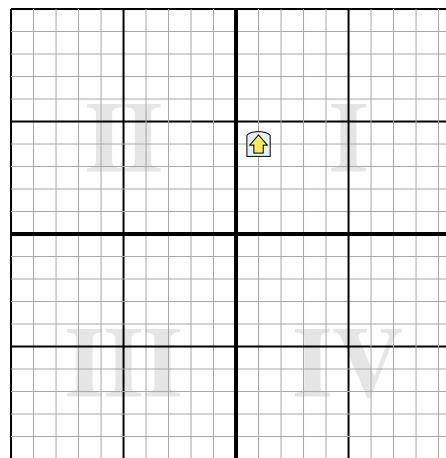
### Answers

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

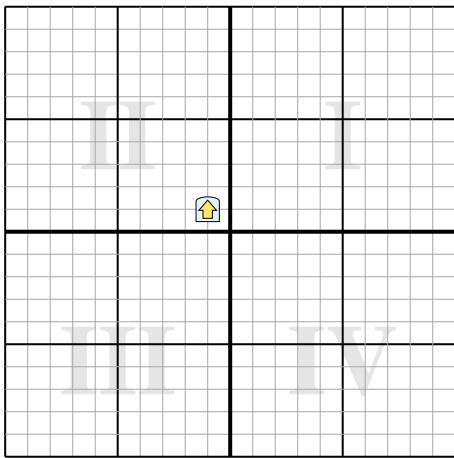
- 1) Rotate the shape  $76^\circ$  around the point (0,0).



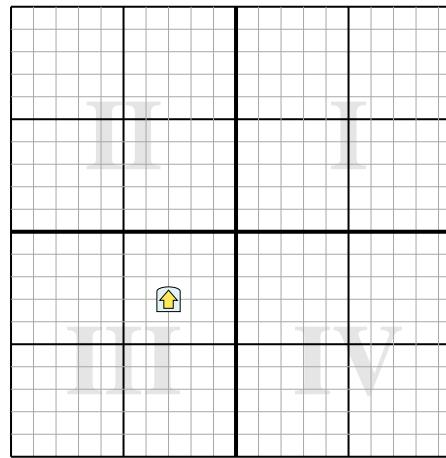
- 2) Rotate the shape  $192^\circ$  around the point (0,0).



- 3) Rotate the shape  $290^\circ$  around the point (0,0).



- 4) Rotate the shape  $-62^\circ$  around the point (0,0).





# Rotating Around Axis

Name: **Answer Key**

**Rotate each shape. Answer as the new coordinates.**

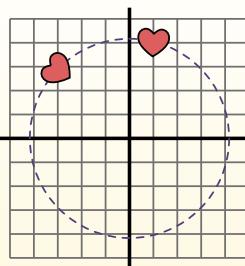
$\theta$  = Angle of Rotation

### 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  $60^\circ$ .



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  $60^\circ$  it is at (-2.98, 2.87).

### Answers

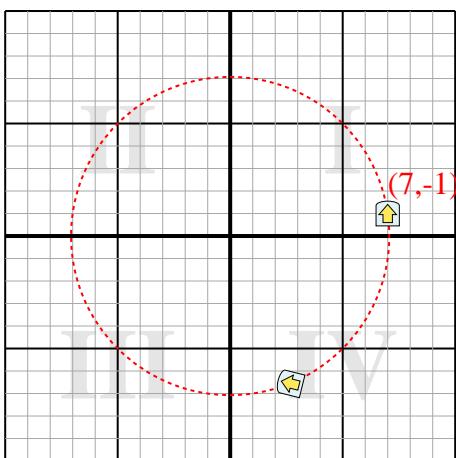
1. **(2.7, -6.6)**

2. **(-1.8, -3.7)**

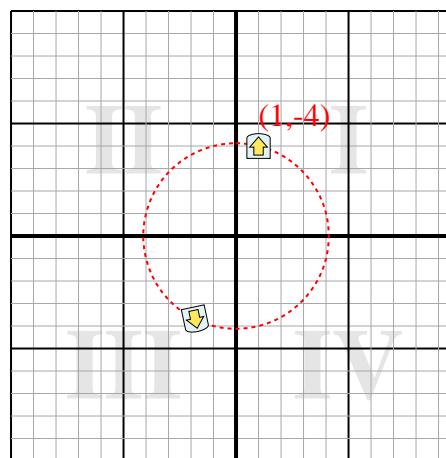
3. **(-1.3, -0.6)**

4. **(1.2, -4.1)**

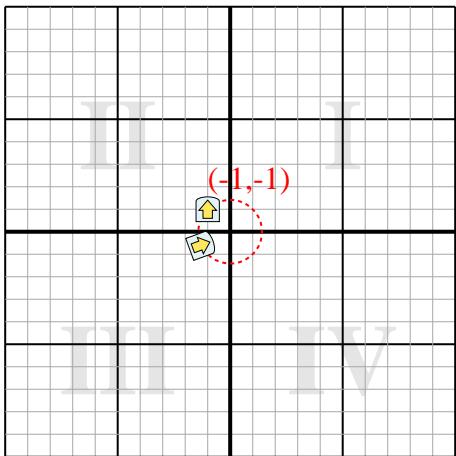
- 1) Rotate the shape  $76^\circ$  around the point (0,0).



- 2) Rotate the shape  $192^\circ$  around the point (0,0).



- 3) Rotate the shape  $290^\circ$  around the point (0,0).



- 4) Rotate the shape  $-62^\circ$  around the point (0,0).

