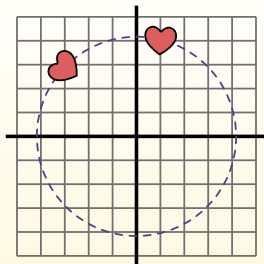


**Rotate each shape. Answer as the new coordinates.** θ = Angle of Rotation**Rotation Formula**

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

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

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



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

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

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

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

3. $x1 = 0.5 - 3.48$

$$y1 = 0.87 + 2$$

4. $x1 = -2.98$

$$y1 = 2.87$$

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

Answers

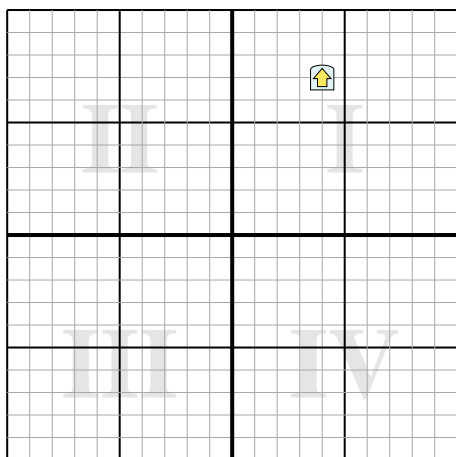
1. _____

2. _____

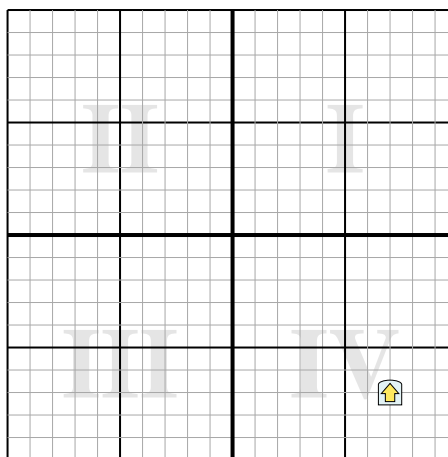
3. _____

4. _____

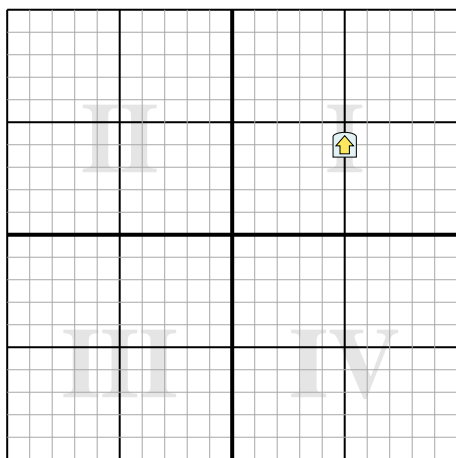
- 1) Rotate the shape 99° around the point (0,0).



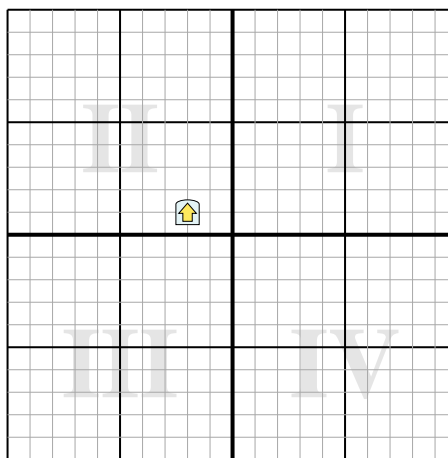
- 2) Rotate the shape -40° around the point (0,0).



- 3) Rotate the shape -292° around the point (0,0).



- 4) Rotate the shape 45° around the point (0,0).





Rotate each shape. Answer as the new coordinates.

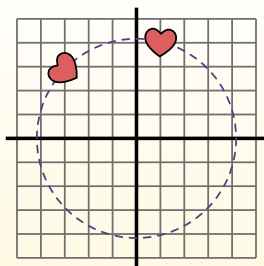
θ = Angle of Rotation

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

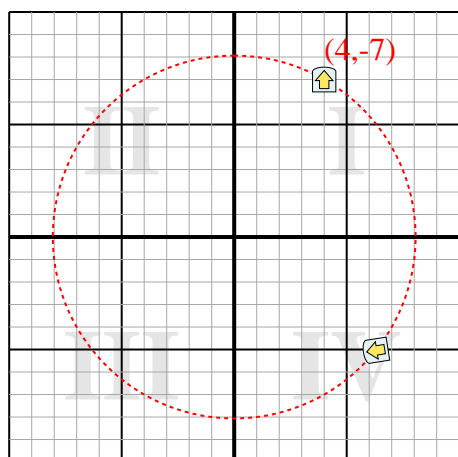
1. **(6.3,-5)**

2. **(9.9,-0.9)**

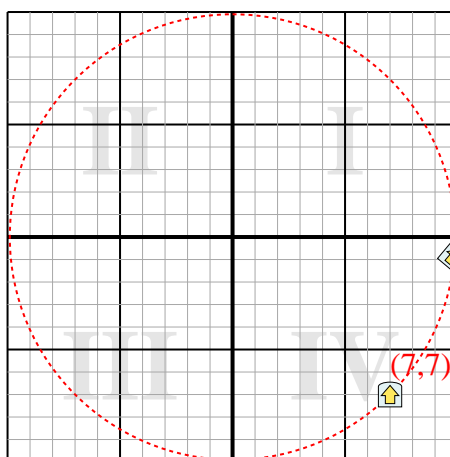
3. **(5.6,-3.1)**

4. **(-0.7,2.1)**

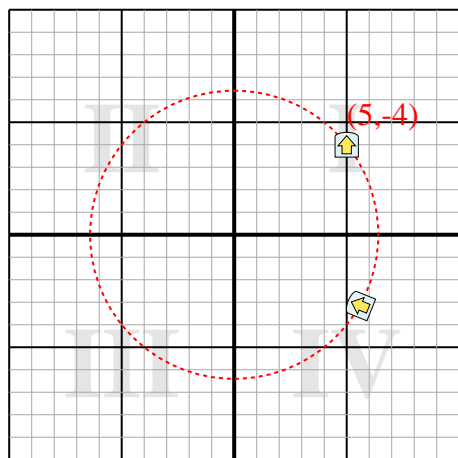
- 1) Rotate the shape 99° around the point (0,0).



- 2) Rotate the shape -40° around the point (0,0).



- 3) Rotate the shape -292° around the point (0,0).



- 4) Rotate the shape 45° around the point (0,0).

