



Rotate each shape. Answer as the new coordinates.

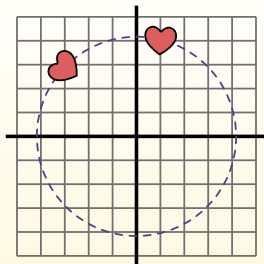
θ = Angle of Rotation

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° .



$$\begin{aligned} 1. \quad x1 &= 1 \times \cos(60) - 4 \times \sin(60) \\ y1 &= 1 \times \sin(60) + 4 \times \cos(60) \end{aligned}$$

$$\begin{aligned} 2. \quad x1 &= 1 \times 0.5 - 4 \times 0.87 \\ y1 &= 1 \times 0.87 + 4 \times 0.5 \end{aligned}$$

$$\begin{aligned} 3. \quad x1 &= 0.5 - 3.48 \\ y1 &= 0.87 + 2 \end{aligned}$$

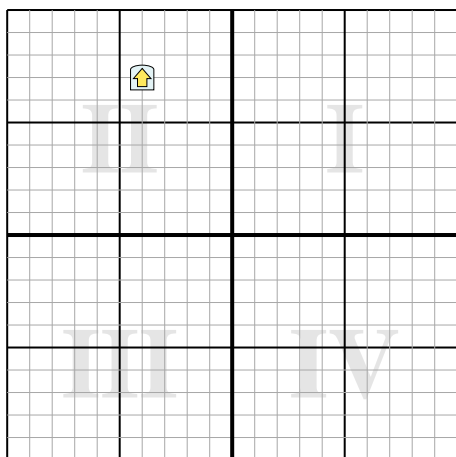
$$\begin{aligned} 4. \quad x1 &= -2.98 \\ y1 &= 2.87 \end{aligned}$$

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

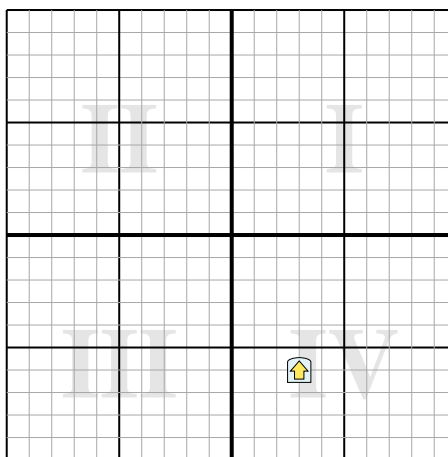
Answers

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

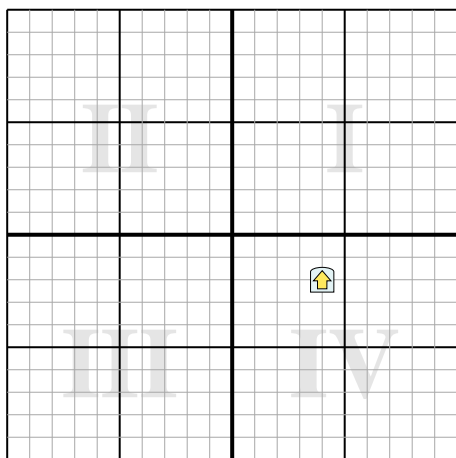
- 1) Rotate the shape 91° around the point (0,0).



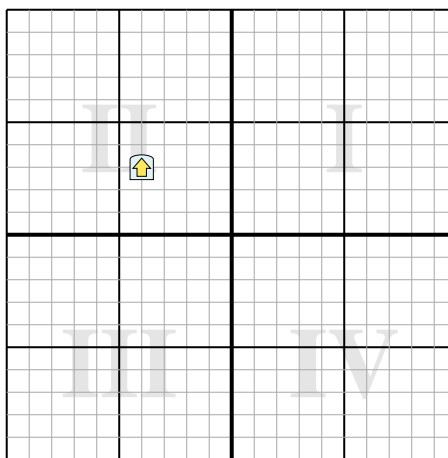
- 2) Rotate the shape -105° around the point (0,0).



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



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

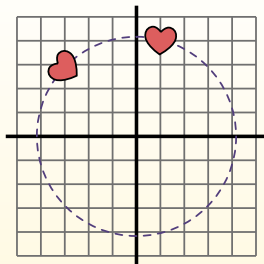


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$$y1 = 1 \times \sin(60) + 4 \times \cos(60)$$

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

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

3. $x1 = 0.5 - 3.48$

$$y1 = 0.87 + 2$$

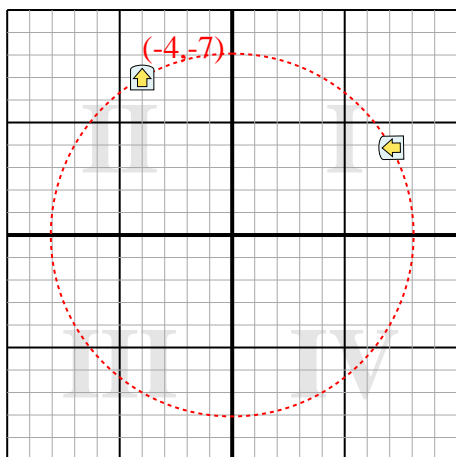
4. $x1 = -2.98$

$$y1 = 2.87$$

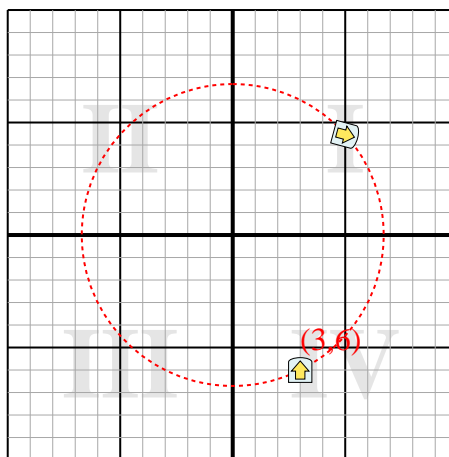
5. Looking at shape, we can see that rotated 60° it is at (-2.98 , 2.87).

Answers1. **(7.1,3.9)**2. **(5,4.5)**3. **(0.4,4.5)**4. **(5,0.3)**

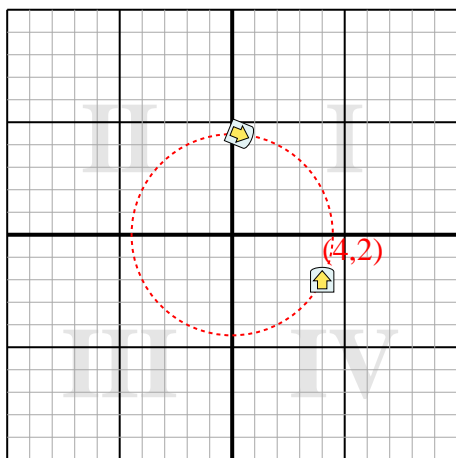
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