



Rotate each shape. Answer as the new coordinates.

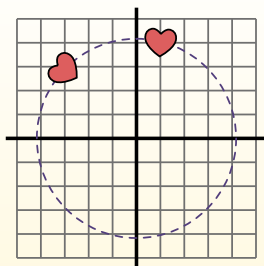
θ = Angle of Rotation

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° .

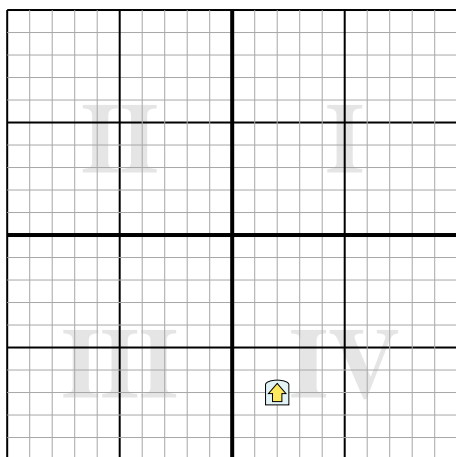


1. $x1 = 1 \times \cos(60) - 4 \times \sin(60)$
 $y1 = 1 \times \sin(60) + 4 \times \cos(60)$
2. $x1 = 1 \times 0.5 - 4 \times 0.87$
 $y1 = 1 \times 0.87 + 4 \times 0.5$
3. $x1 = 0.5 - 3.48$
 $y1 = 0.87 + 2$
4. $x1 = -2.98$
 $y1 = 2.87$
5. Looking at shape, we can see that rotated 60° it is at $(-2.98, 2.87)$.

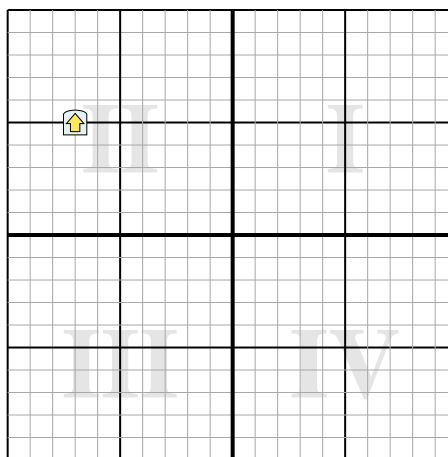
Answers

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

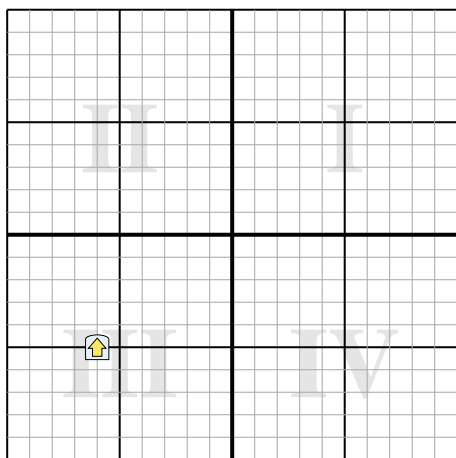
- 1) Rotate the shape 142° around the point (0,0).



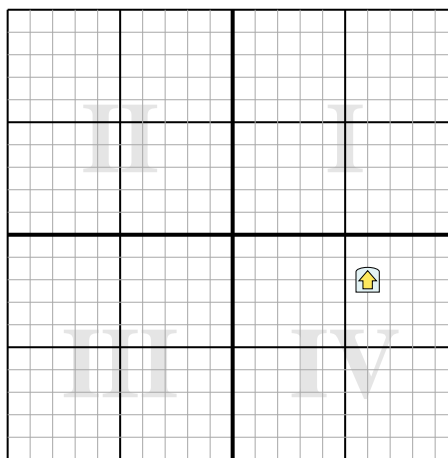
- 2) Rotate the shape -78° around the point (0,0).



- 3) Rotate the shape -108° around the point (0,0).



- 4) Rotate the shape -93° around the point (0,0).





Rotate each shape. Answer as the new coordinates.

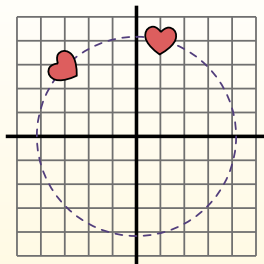
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In the example to the right the shape is at coordinates (1,4). Lets find the coordinates if we rotated the shape 60° .



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

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

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

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

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

Answers

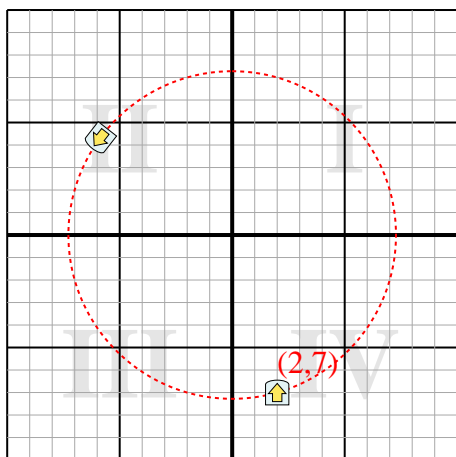
1. **$(-5.9, 4.3)$**

2. **$(-6.3, -5.8)$**

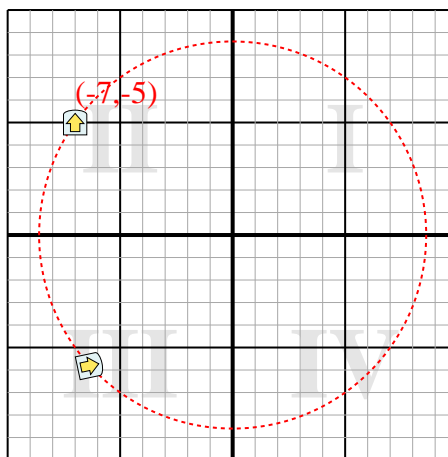
3. **$(6.6, -4.2)$**

4. **$(1.7, 6.1)$**

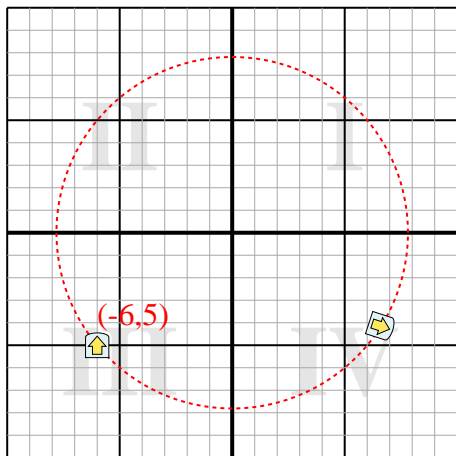
1) Rotate the shape 142° around the point (0,0).



2) Rotate the shape -78° around the point (0,0).



3) Rotate the shape -108° around the point (0,0).



4) Rotate the shape -93° around the point (0,0).

