



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° .

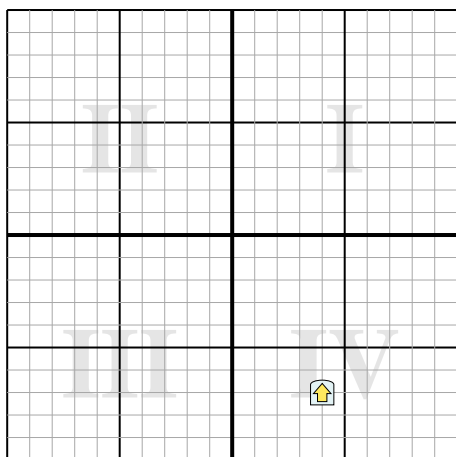


- $x1 = 1 \times \cos(60) - 4 \times \sin(60)$
 $y1 = 1 \times \sin(60) + 4 \times \cos(60)$
- $x1 = 1 \times 0.5 - 4 \times 0.87$
 $y1 = 1 \times 0.87 + 4 \times 0.5$
- $x1 = 0.5 - 3.48$
 $y1 = 0.87 + 2$
- $x1 = -2.98$
 $y1 = 2.87$
- Looking at shape, we can see that rotated 60° it is at (-2.98 , 2.87).

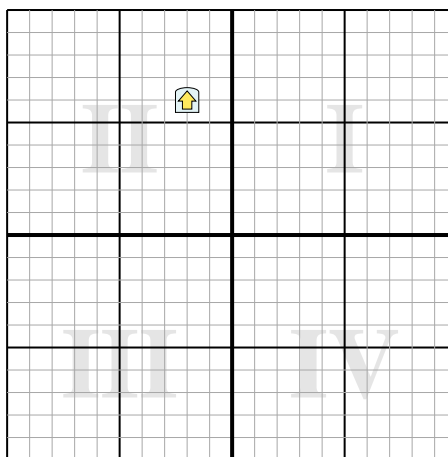
Answers

- _____
- _____
- _____
- _____

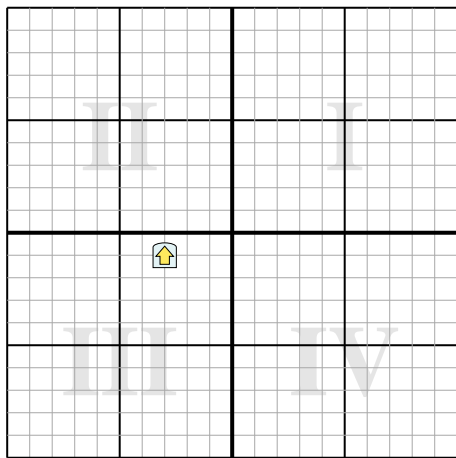
- 1) Rotate the shape -91° around the point (0,0).



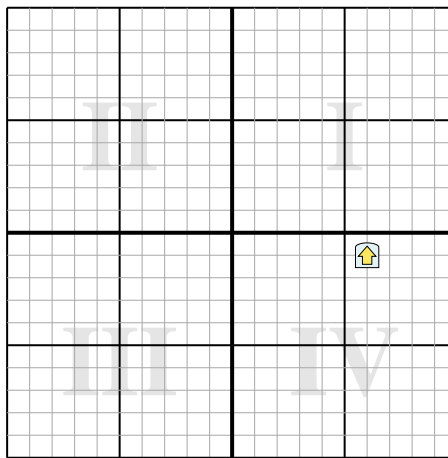
- 2) Rotate the shape -189° around the point (0,0).



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



- 4) Rotate the shape 202° around the point (0,0).





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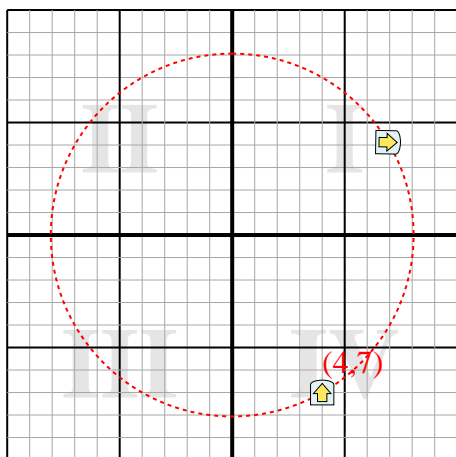


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2. $x1 = 1 \times 0.5 - 4 \times 0.87$
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3. $x1 = 0.5 - 3.48$
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5. Looking at shape, we can see that rotated 60° it is at (-2.98 , 2.87).

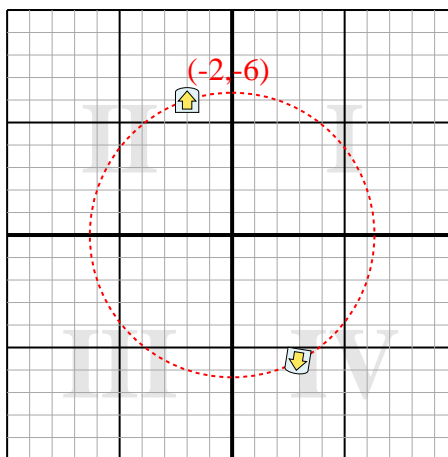
Answers

1. **(6.9,4.1)**
2. **(2.9,-5.6)**
3. **(2.9,-1.2)**
4. **(-5.2,3.2)**

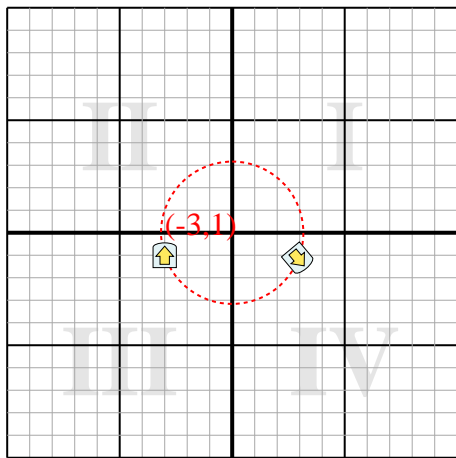
- 1) Rotate the shape -91° around the point (0,0).



- 2) Rotate the shape -189° around the point (0,0).



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



- 4) Rotate the shape 202° around the point (0,0).

