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°.
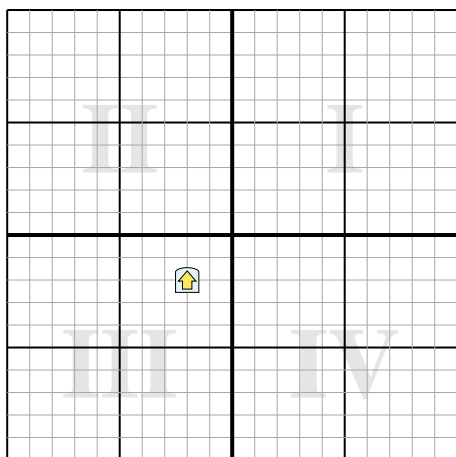
1. $x1 = 1 \times \cos(60) - 4 \times \sin(60)$
   $y1 = 1 \times \sin(60) + 4 \times \cos(60)$

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. $x1 = -2.98$
   $y1 = 2.87$

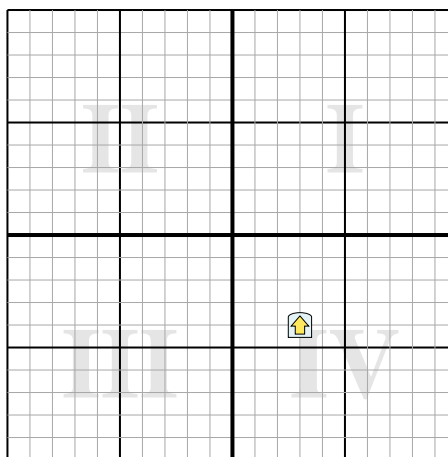5. Looking at shape, we can see that rotated 60° it is at (-2.98 , 2.87).
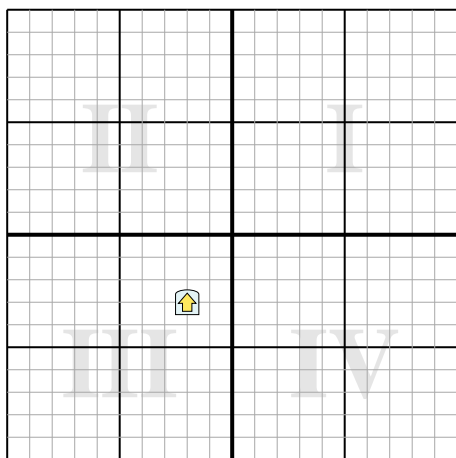
1. _____

2. _____

3. _____

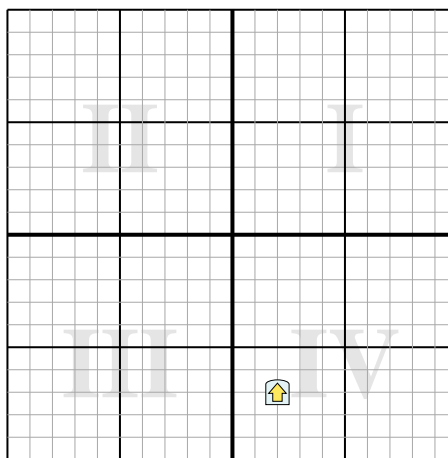4. _____

1) Rotate the shape 74° around the point (0,0).

2) Rotate the shape 325° around the point (0,0).

3) Rotate the shape -102° around the point (0,0).

4) Rotate the shape 68° 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°.
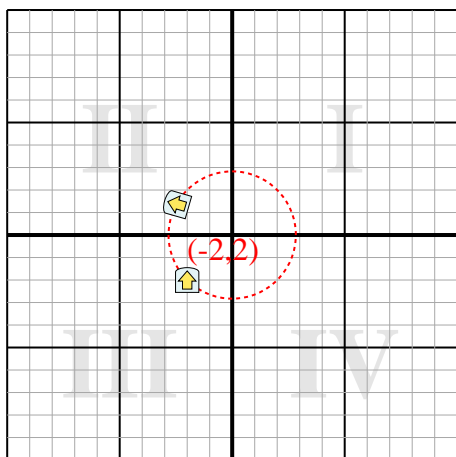
1. $x1 = 1 \times \cos(60) - 4 \times \sin(60)$
    $y1 = 1 \times \sin(60) + 4 \times \cos(60)$

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).
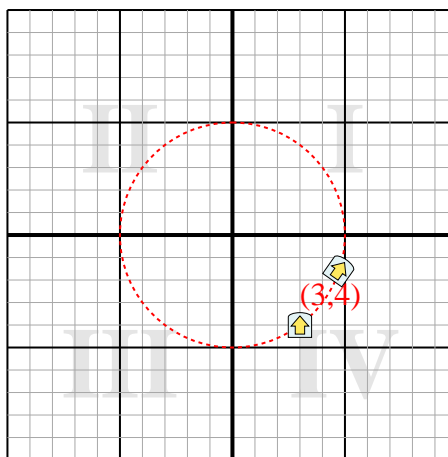
Answers

1. **(-2.5,1.4)**

2. **(4.8,-1.6)**

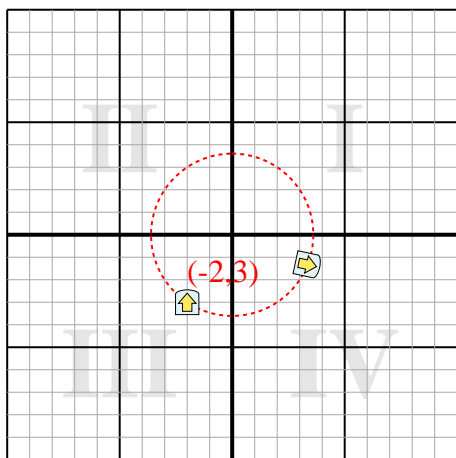3. **(3.4,-1.3)**

4. **(-5.7,-4.5)**

1) Rotate the shape 74° around the point (0,0).

(-2,2)

2) Rotate the shape 325° around the point (0,0).

(3,4)

3) Rotate the shape -102° around the point (0,0).

(-2,3)

4) Rotate the shape 68° around the point (0,0).

(2,7)

Math