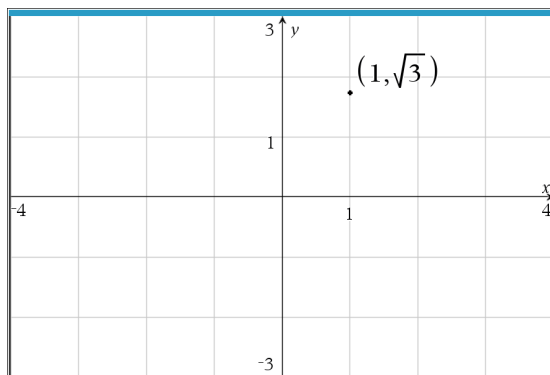


**Practice Problem 1**



The graph of point R is shown in the rectangular plane. Which of the following are possible polar coordinates of point R?

- (a)  $\left(2, \frac{\pi}{6}\right)$
- (b)  $\left(1, \frac{\pi}{3}\right)$
- (c)  $\left(2, \frac{\pi}{3}\right)$
- (d)  $\left(1, \frac{\pi}{6}\right)$

**Practice Problem 2**

The point Q has polar coordinates  $\left(8, \frac{2\pi}{3}\right)$ . Which of the following is the location of Q in rectangular coordinates?

- (a)  $(4, 4\sqrt{3})$
- (b)  $(4\sqrt{3}, 4)$
- (c)  $(-4, 4\sqrt{3})$
- (d)  $(4\sqrt{3}, -4)$

**Practice Problem 1 Solution:**

(c)  $\left(2, \frac{\pi}{3}\right)$

Students need to convert to polar coordinate form using the formulas  $r^2 = x^2 + y^2$  and  $\tan \theta = \frac{y}{x}$ .

$$r^2 = 1^2 + (\sqrt{3})^2 \rightarrow r = \sqrt{1+3} \rightarrow r = \sqrt{4} \rightarrow r = 2$$

$$\tan \theta = \frac{\sqrt{3}}{1} \rightarrow \arctan(\sqrt{3}) \text{ or } \tan^{-1}(\sqrt{3}) = \frac{\pi}{3}$$

**Practice Problem 2 Solution:**

(c)  $(-4, 4\sqrt{3})$

Students need to convert to rectangular form using the formulas  $x = r \cos \theta$  and  $y = r \sin \theta$ .

$$x = 8 \cos \frac{2\pi}{3} = 8 \left(-\frac{1}{2}\right) = -4$$

$$y = 8 \sin \frac{2\pi}{3} = 8 \left(\frac{\sqrt{3}}{2}\right) = 4\sqrt{3}$$

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