## Lesson 10 Practice Problems

1. A rotation takes $P$ to $Q$. What could be the measure of the angle of rotation in radians? Select all that apply.

A. $\frac{3 \pi}{2}$
B. $\frac{\pi}{2}$
C. $\frac{\pi}{4}$
D. $\frac{5 \pi}{2}$
E. $\frac{5 \pi}{4}$
2. a. A $\frac{2 \pi}{3}$ radian rotation takes $N$ to $P$. Label $P$.
b. A $\frac{7 \pi}{6}$ radian rotation takes $N$ to $Q$. Label $Q$.
c. A $\frac{25 \pi}{6}$ radian rotation takes $N$ to $R$. Label $R$.

3. Here is a wheel with radius 1 foot.

a. List three different counterclockwise angles the wheel can rotate so that point $P$ ends up at position $Q$.
b. How many feet does the wheel roll for each of these angles?
4. The point $P$ on the unit circle is in the 0 radian position.
a. Which counterclockwise rotations take $P$ back to itself? Explain how you know.
b. Which counterclockwise rotations take $P$ to the opposite point on the unit circle? Explain how you know.
5. Here is the unit circle with a point $P$ at $(1,0)$. Find the coordinates of $P$ after the circle rotates the given amount counterclockwise around its center.

a. $\frac{1}{3}$ of a full rotation
b. $\frac{1}{2}$ of a full rotation
c. $\frac{2}{3}$ of a full rotation
(From Unit 6, Lesson 4.)
6. Here is a graph of $y=\sin (\theta)$.
a. Plot the points on the graph where $\sin (\theta)=-\frac{1}{2}$.
b. For which angles $\theta$ does $\sin (\theta)=-\frac{1}{2}$ ?

(From Unit 6, Lesson 9.)
