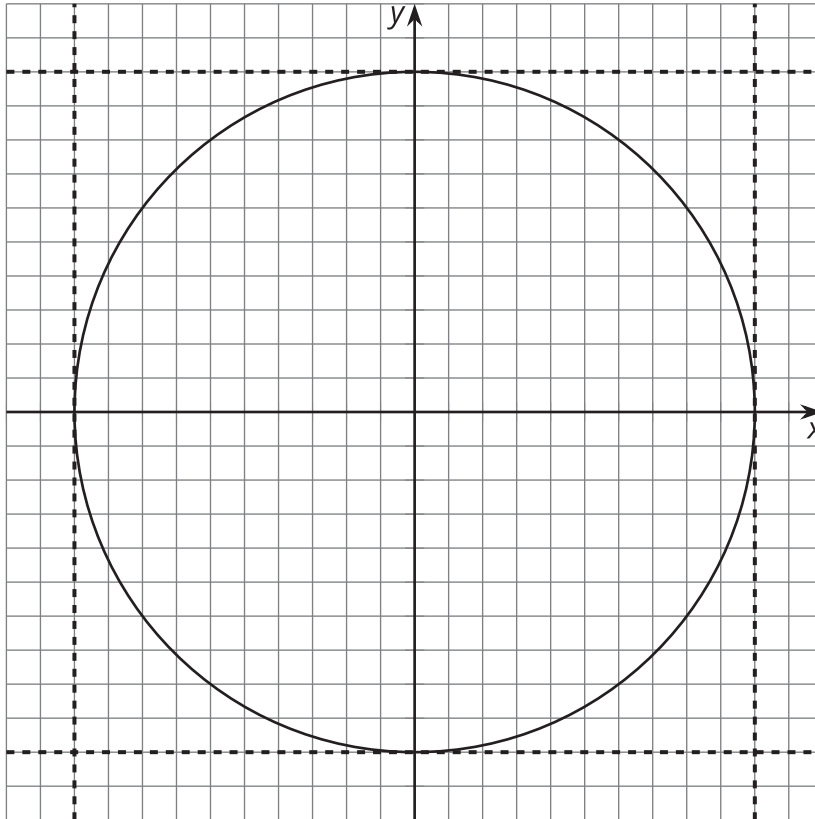# Unit 6 Lesson 3: The Unit Circle (Part 1)

1 Finding Coordinates of Points on the Unit Circle (Warm up)
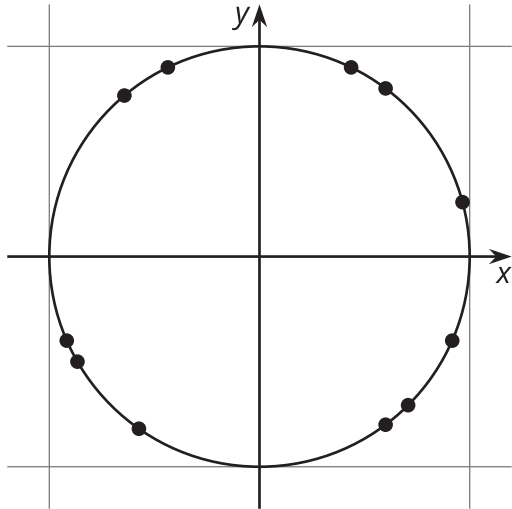
Student Task Statement

1. The x-coordinate of a point on the unit circle is $\frac{3}{5}$. What does this tell you about where the point might lie on the unit circle? Find any possible y-coordinates of the point and plot them on the unit circle.

2. The y-coordinate of a point on the unit circle is -0.4. What does this tell you about where the point might lie on the unit circle? Find any possible x-coordinates of the point and plot them on the unit circle.
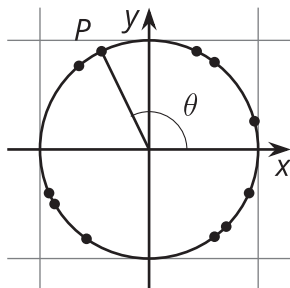
2 Which Point?

Student Task Statement

All points are 1 unit from the origin.

Choose one of the points. Be prepared to describe its location using only words.

Activity Synthesis

3 Measuring Circles (Optional)

Student Task Statement

1. Your teacher will give you a circular object.

    a. About how many radii does it take to go halfway around the circle?

    b. About how many radii does it take to go all the way around the circle?

    c. Compare your answers to the previous two questions with your partners.

2. What is the exact number of radii that fit around the circumference of the circle? Explain how you know.

3. Why doesn't the number of radii that fit around the circumference of a circle depend on the radius of the circle? Explain how you know.
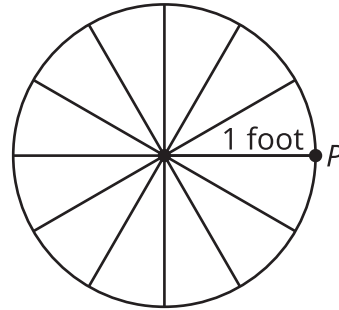
Activity Synthesis
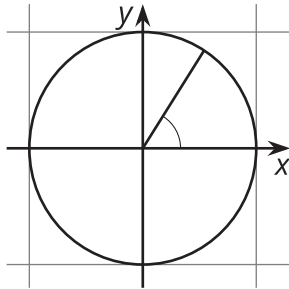
4 Around a Bike Wheel

Student Task Statement

A bicycle wheel has a 1 foot radius. The wheel rolls to the left (counterclockwise).

1. What is the circumference of this wheel?

2. Mark the point Q where P will be after the wheel has rolled 1 foot to the left. Be prepared to explain your reasoning.

3. Mark the point R where P will be after the wheel has rolled 3 feet to the left. What angle, in radians, does P rotate through to get to R? Explain your reasoning.

4. Where will point P be after the bike has traveled π feet to the left? What about 10π feet? 100π feet? Mark these points on the circle. Explain your reasoning.

5. After traveling some distance to the left, the point P is at the lowest location in its rotation. How far might the bike have traveled? Explain your reasoning.