Radian Measure Lab

1. Consider the question "What is the radian measure of an angle?". Which of the following would be an appropriate answer? __________
   a. The radian measure of an angle is the length of the arc it subtends on the unit circle.
   b. The radian measure of an angle is the length of the arc it subtends divided by the radius.
   c. The radian measure of an angle is the number of radii the subtended arc contains.

2. What's the relationship between the following questions in an r-unit circle and an angle θ of the circle in standard position?
   How many radians are in the angle?
   How many radii are in the angle's intercepted arc?

3. How many radians are in a unit circle? in any circle?

4. How many degrees are there in 1 radian? 1° = ______°

5. How many radians are there in 1 degree? 1° = ______ r

6. If an angle of 1° subtends (determines) an arc of length one in the unit circle, does it subtend an arc of length "r" in a circle whose radius is "r"? Illustrate your answer.

7. One radian on the unit circle subtends an arc of one unit. What size arc is determined by one radian on an r-unit circle?

8. Consider the equation $\theta = \frac{s}{r}$, where $\theta$ is an angle in standard position, $s$ is the length of the subtended arc, and $r$ is the radius of the circle. Explain what the equation means.
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9. Find the indicated unknown on the following r-unit circles.

a.

b.

c.

d.

e.

f.

10. Use the drawing below to answer the following.

a. On the unit circle at right:
   1)  ( , )
   2)  \( s = \) 

b. On the 2-unit circle above:  1)  ( , )  2)  \( s = \) 

11. Use the drawing below to answer the following.  \textbf{NOTE:}  \( m\angle X = m\angle X' \)

a.  ( , , ) on the unit circle at right.

b. What kind of transformation relates the unit circle and the 2.5-unit circle?  Be sure to use the proper symbol when describing the transformation.