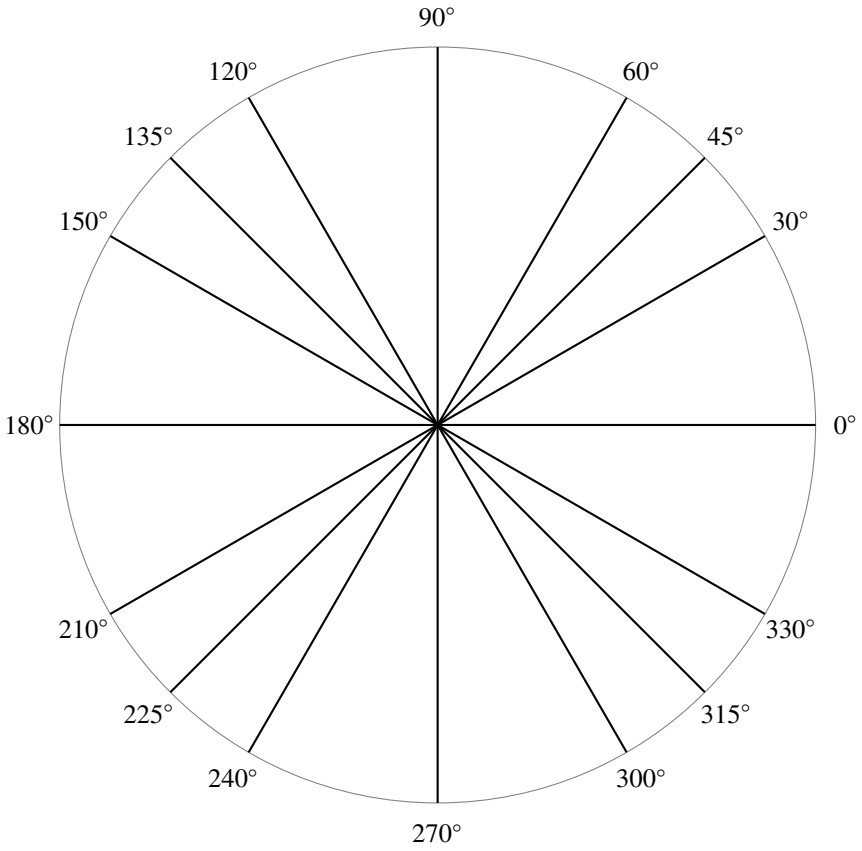
Section 3.1

The Radian Measure and Arclength

1. State the radian measure of all multiples of $30°$ and $45°$ going around a circle using the notion of these angles as a fraction of a full circle.



Converting Between Measures

2. Convert 108° to radians.

3. Convert -457.89° to radians.

4. Convert $\frac{11\pi}{12}$ to degrees.

5. Convert $-\frac{7\pi}{6}$ to degrees.

6. Convert 15.292 to degrees.

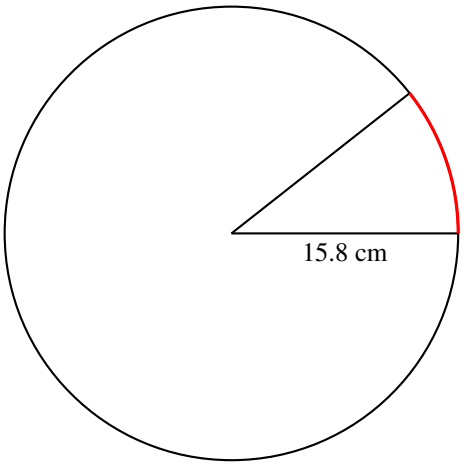
7. Find the value of $\cos\left(\frac{5\pi}{6}\right)$.

8. Find the value of $\sin\left(\frac{\pi}{4}\right)$.

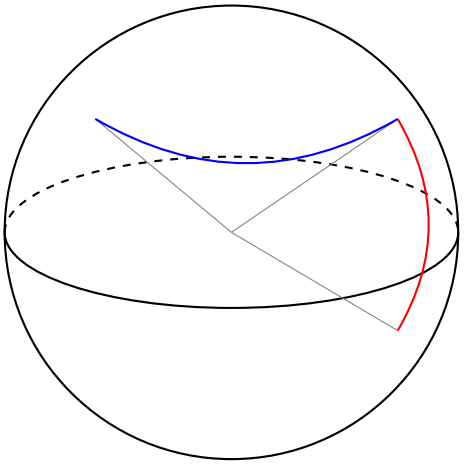
9. Find the value of $\cot\left(-\frac{2\pi}{3}\right)$.

Arc length

Problem 10. Find the arc length intercepted by a central angle of 38.2° in a circle of radius 15.8 cm.



Problem 11. Suppose that city A has a latitude of 38°N and city B, which is due south, has a latitude of 15°S, what is the distance between the cities given that the radius of the Earth is 3959 mi? Could you answer the same question, but for a city C that is measured 38° west of city A?



Problem 12. A small gear of radius 3.6 inches drives a larger gear of radius 5.4 inches. Find the angle the larger gear rotates if the smaller drive gear rotates 150°.