This part consists of 8 multiple choice problems. Nothing more than the answer is required; consequently no partial credit will be awarded.

1. Express $80^\circ$ in radians.

A. $\frac{\pi}{9}$

B. $\frac{2\pi}{9}$

C. $\frac{4\pi}{9}$

D. $\frac{5\pi}{9}$

E. $\frac{7\pi}{9}$

2. Express $\frac{7\pi}{6}$ rad in degrees.

A. $210^\circ$

B. $220^\circ$

C. $230^\circ$

D. $240^\circ$

E. $250^\circ$
3. Find an angle that is coterminal with the angle \( \theta = 20^\circ \) in standard position.

A 200°
B 160°
C -160°
D -200°
E -340°

4. Find an angle that is coterminal with the angle \( \theta = \frac{\pi}{5} \) in standard position.

A \( \frac{2\pi}{5} \)
B \( \frac{4\pi}{5} \)
C \( \frac{6\pi}{5} \)
D \( \frac{11\pi}{5} \)
E \( \frac{12\pi}{5} \)

5. Find an angle with measure between 0° and 360° that is coterminal with the angle of measure 1567° in standard position.

A 107°
B 117°
C 127°
D 137°
E None of the above
6. Find the length of an arc of a circle with radius 27 m that subtends a central angle of 60°.

   A  \( \frac{9\pi}{2} \)
   B  \( \frac{5\pi}{2} \)
   C  \( \frac{9\pi}{4} \)
   D  \( \frac{27\pi}{4} \)
   E  \( \frac{9\pi}{2} \)

7. A central angle \( \theta \) in a circle of radius 12 m is subtended by an arc of length 22 m. Find the measure of \( \theta \) in radians.

   A  \( \frac{6}{11} \)
   B  \( \frac{11}{6} \)
   C  \( \frac{6\pi}{11} \)
   D  \( \frac{11\pi}{6} \)
   E  None of the above

8. Find the area of a sector of a circle with central angle 60° if the radius of the circle is \( \sqrt{3} \) m.

   A  \( \frac{\pi}{2} \)
   B  \( \frac{3\pi}{2} \)
   C  \( \frac{\pi}{3} \)
   D  \( \frac{2\pi}{3} \)
   E  \( \pi \)
In the following problems you are required to show all your work and provide the necessary explanations everywhere to get full credit.

1. A satellite in a circular orbit 1250 kilometers above Earth makes one complete revolution every 110 minutes. What is its angular and linear speed? Assume that Earth is a sphere of radius 6400 kilometers.

2. A biologist wants to know the width \( w \) of a river (see figure) in order to properly set instruments for studying the pollutants in the water. From point \( A \), the biologist walks downstream 100 feet and sights to point \( C \). From this sighting, it is determined that \( \theta = 58^\circ \). How wide is the river?