6.1 and 6.2 Problems

Examples:
1. Convert (a) 19°35’4” to degree decimal form
   
   (b) Convert 58.201° to D°M’S” form

2. Use arc length formula \( s = r\theta \) to find the missing value.
   
   \[(a) \ r = 65\text{ inches}, \ \theta = 9^\circ \quad (b) \ s = 20\text{ miles}, \ r = 18\text{ miles} \]

   (a)

   (b)

3. Convert (a) 630° to exact radian
   
   (b) 61° to decimal radian

   (c) .92 rad to degrees

4. Find the area of the sector of a circle of radius 50 inches and central angle \( \frac{1}{4} \) radian.

5. An object is traveling around a circle with a radius of 8 inches. If in 40 seconds a central angle of \( \frac{1}{3} \) radian is swept out, what are the linear and angular speeds of the object?
6. Find the exact values of \( \sin t, \cos t, \tan t, \csc t, \sec t, \cot t \) if \( P = \left( \frac{-\sqrt{11}}{6}, \frac{5}{6} \right) \) is the point on the unit circle that corresponds to the real number \( t \).

7. Find the exact value of \( \tan (8\pi) \).

8. Find the exact value of

\[
(a) \cot \frac{13\pi}{4} \quad (b) \csc 765^0 \quad (c) \sin \frac{7\pi}{6} \quad (d) \cos 330^0 \quad (e) \tan 300^0 \quad (f) \sec \frac{4\pi}{3}.
\]

9. Use a calculator to find the approximate value of

\[
(a) \cot 3.2 \quad (b) \csc 515^0 \quad (c) \cos \frac{5\pi}{7}.
\]

10. The point \( P = (-10, -2) \) is on the terminal side of an angle \( \theta \). Find the exact value of the six trigonometric functions.
Answers:
1. (a) 19.58°  (b) 58°12’4” (nearest second)
2. (a) $s = 10.21 \text{inches}$  (b) $\theta = 1.11$
3. (a) $\frac{7\pi}{2}$  (b) 1.06  (c) $52.71^0$
4. $A = 312.5 \text{inches}^2$
5. $v = 0.067 \text{inches/sec}$  $\omega = 0.008 \text{radian/sec}$

Answers:
6. $\sin t = \frac{5}{6}$, $\cos t = -\frac{\sqrt{11}}{6}$, $\tan t = -\frac{5\sqrt{11}}{11}$, $\csc t = \frac{6}{5}$, $\sec t = -\frac{6\sqrt{11}}{11}$, $\cot t = -\frac{\sqrt{11}}{5}$  $2.0$
7. (a) $1$  (b) $\sqrt{2}$  (c) $-\frac{1}{2}$  (d) $\frac{\sqrt{3}}{2}$  (e) $-\sqrt{3}$  (f) $-2$
8. (a) 17.1  (b) 2.366  (c) -0.623
9. $\sin \theta = -\frac{\sqrt{26}}{26}$, $\cos \theta = -\frac{5\sqrt{26}}{26}$, $\tan \theta = \frac{1}{5}$, $\csc \theta = -\frac{\sqrt{26}}{26}$, $\sec \theta = -\frac{\sqrt{26}}{5}$, $\cot \theta = 5$