

13.2 Define General Angles and Use Radian Measure

pp. 859–865

EXAMPLE

Convert 110° to radians and $\frac{7\pi}{12}$ radians to degrees.

$$\begin{aligned} 110^\circ &= 110^\circ \left(\frac{\pi \text{ radians}}{180^\circ} \right) & \frac{7\pi}{12} \text{ radians} &= \left(\frac{7\pi}{12} \text{ radians} \right) \left(\frac{180^\circ}{\pi \text{ radians}} \right) \\ &= \frac{11\pi}{18} \text{ radians} & &= 105^\circ \end{aligned}$$

EXERCISES

Convert the degree measure to radians or the radian measure to degrees.

8. 145° 9. -80° 10. $\frac{4\pi}{3}$ 11. $\frac{11\pi}{6}$

EXAMPLE 3

on p. 861
for Exs. 8–11

13.3 Evaluate Trigonometric Functions of Any Angle

pp. 866–872

EXAMPLE

Evaluate $\sec 120^\circ$.

The reference angle is $\theta' = 180^\circ - 120^\circ = 60^\circ$. The secant function is negative in Quadrant II, so you can write:

$$\sec 120^\circ = -\sec 60^\circ = -2$$

EXERCISES

Evaluate the function without using a calculator.

12. $\tan 330^\circ$ 13. $\csc(-405^\circ)$ 14. $\sin \frac{13\pi}{6}$ 15. $\sec \frac{11\pi}{3}$

EXAMPLE 4

on p. 869
for Exs. 12–15

13.4 Evaluate Inverse Trigonometric Functions

pp. 875–880

EXAMPLE

Evaluate $\tan^{-1} 1$ in both radians and degrees.

When $-\frac{\pi}{2} < \theta < \frac{\pi}{2}$, or $-90^\circ < \theta < 90^\circ$, the angle θ whose tangent is 1 is:

$$\theta = \tan^{-1} 1 = \frac{\pi}{4} \quad \text{or} \quad \theta = \tan^{-1} 1 = 45^\circ$$

EXERCISES

16. Evaluate $\sin^{-1}(-0.5)$ in both radians and degrees.
17. **RAMP** You use a 12 foot ramp to load items into a van. If the floor of the van is 4 feet off the ground, what is the angle of elevation of the ramp?

EXAMPLES 1 and 4

on pp. 876–877
for Exs. 16–17