EXAMPLE 3 Convert between degrees and radians

READING
The unit "radians" is often omitted. For instance, the measure $-\frac{\pi}{12}$ radians may be written simply as $-\frac{\pi}{12}$.

Convert (a) 125° to radians and (b) $-\frac{\pi}{12}$ radians to degrees.

a. $125° = 125°\left(\frac{\pi \text{ radians}}{180°}\right)$

$= \frac{25\pi}{36}$ radians

b. $-\frac{\pi}{12} = \left(-\frac{\pi}{12} \text{ radians}\right)\left(\frac{180°}{\pi \text{ radians}}\right)$

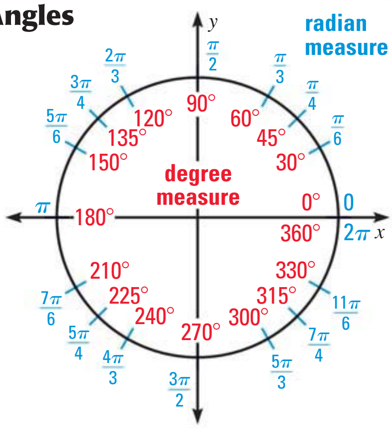
$= -15°$

CONCEPT SUMMARY — *For Your Notebook*

Degree and Radian Measures of Special Angles

The diagram shows equivalent degree and radian measures for special angles from 0° to 360° (0 radians to 2π radians).

You may find it helpful to memorize the equivalent degree and radian measures of special angles in the first quadrant and for $90° = \frac{\pi}{2}$ radians. All other special angles are just multiples of these angles.



✓ GUIDED PRACTICE for Example 3

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

5. 135°

6. −50°

7. $\frac{5\pi}{4}$

8. $\frac{\pi}{10}$

SECTORS OF CIRCLES A **sector** is a region of a circle that is bounded by two radii and an arc of the circle. The **central angle** θ of a sector is the angle formed by the two radii. There are simple formulas for the arc length and area of a sector when the central angle is measured in radians.

KEY CONCEPT — *For Your Notebook*

Arc Length and Area of a Sector

The arc length s and area A of a sector with radius r and central angle θ (measured in radians) are as follows.

Arc length: $s = r\theta$

Area: $A = \frac{1}{2}r^2\theta$