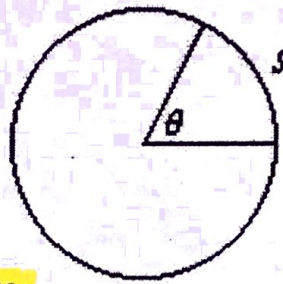


Arc Length and Area of a Sector:

Arc length – this is the length of the arc!

S = arc length

“SOAR”



$$S = \theta r$$

just remember that θ must be in radians

$S = ?$

Example 1: Find the length of the arc if the radius = 7 cm and $\theta = \frac{2\pi}{3}$.

$$r = 7$$

$$\theta = \frac{2\pi}{3}$$

$$S = \frac{2\pi}{3} (7) = \frac{14\pi}{3} \text{ cm}$$

$S = ?$

Example 2: Find the length of the arc if the diameter = 15.4 cm and $\theta = 150^\circ$.

$$\frac{15.4}{2} \rightarrow r = 7.7$$

$$\theta = 150 \cdot \frac{\pi}{180} = \frac{5\pi}{6}$$

↑ radians!

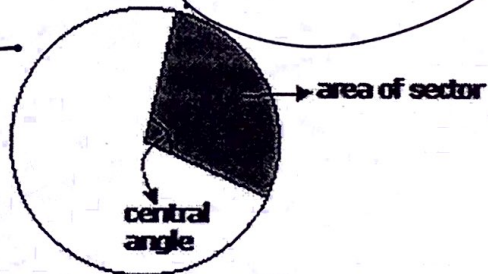
$$S = \frac{5\pi}{6} (7.7) = \frac{77\pi}{12} \text{ cm}$$

Area of a sector – the area of a section of the circle

A = area of the sector

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

again, θ must be in radians



Example 3: Find the area of the sector if the radius = 7 cm and $\theta = \frac{2\pi}{3}$.

$$A = \frac{1}{2} (7)^2 \left(\frac{2\pi}{3}\right) = \frac{49\pi}{3} \text{ cm}^2$$

Example 4: Find the area of the sector if the diameter = 15.4 cm and $\theta = 150^\circ$ (use ex. 2)

$$A = \frac{1}{2} (7.7)^2 \left(\frac{5\pi}{6}\right) = \frac{5929\pi}{240} \text{ cm}^2$$

β

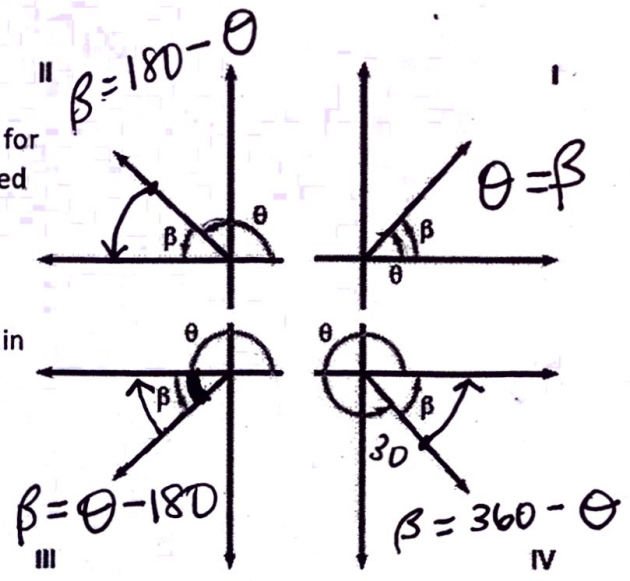
Reference Angles: P.13

Associated with every angle drawn in standard position (except for quadrantal angles). The reference angle is the acute angle formed by the terminal side of the given angle and the x axis.

The reference angle is always positive & acute.

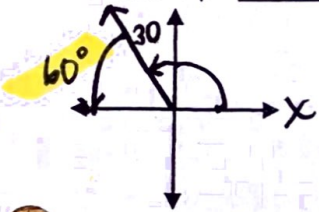
Please note, there is no need to find reference angles for angles in quadrant I.

- * positive
- * acute
- * to the x-axis !!

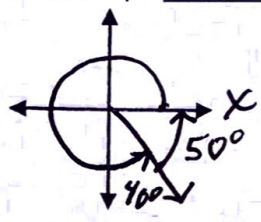


Sketch a picture of the angle given. Then find the reference angle β for each of the following angles.

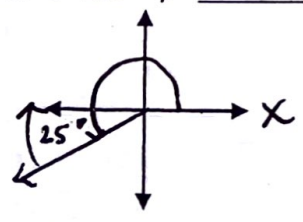
1. $\theta = 120^\circ$ $\beta = 60^\circ$



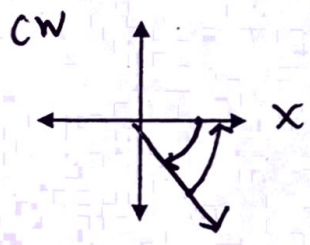
2. $\theta = 310^\circ$ $\beta = 50^\circ$



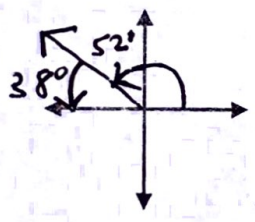
3. $\theta = 205^\circ$ $\beta = 25^\circ$



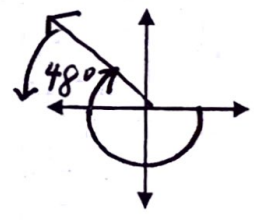
4. $\theta = -60^\circ$ $\beta = 60^\circ$



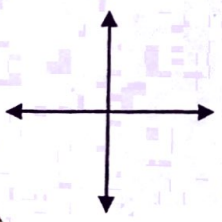
5. $\theta = 142^\circ$ $\beta = 38^\circ$



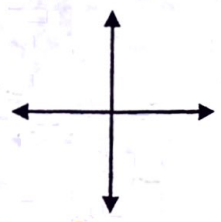
6. $\theta = -228^\circ$ $\beta = 48^\circ$



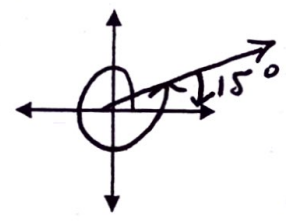
7. $\theta = 194^\circ$ $\beta = 14^\circ$



8. $\theta = 26^\circ$ $\beta = 26^\circ$



9. $\theta = 375^\circ$ $\beta = 15^\circ$

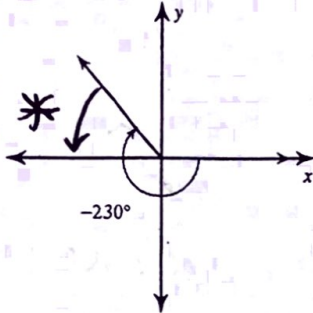


If you need to find reference angles for angles that are measured in radians, change the angle to degrees first!

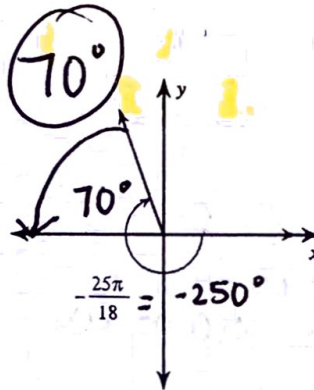
Coterminal Angles and Reference Angles

Find the reference angle.

1)

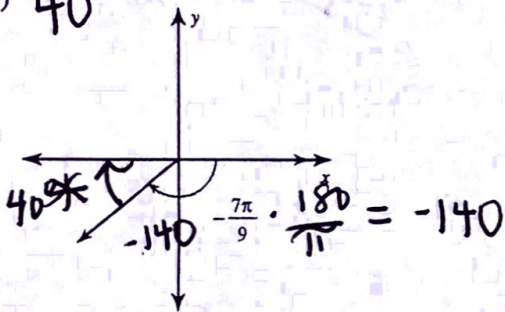


2)



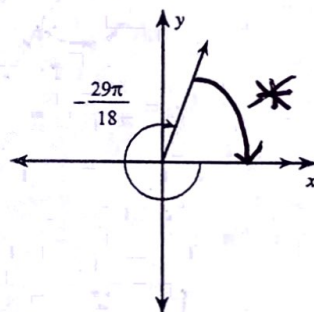
$$-\frac{25\pi}{18} \cdot \frac{180}{\pi} = -250^\circ$$

3) 40°

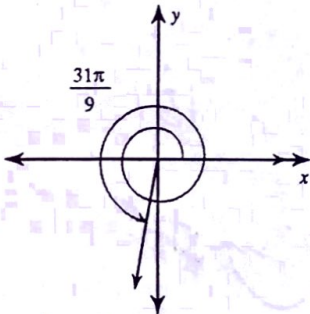


$$-\frac{7\pi}{9} \cdot \frac{180}{\pi} = -140$$

4)



5)



6)

