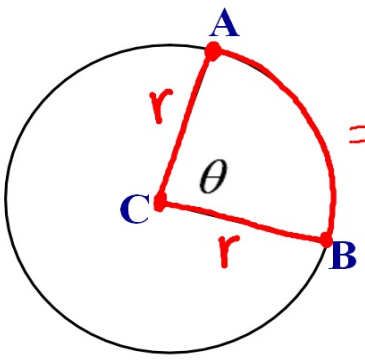
13-2 Radian Measure, Arc Length, and Sector Area

Trig. Std. 1.0



Arc Length (s) (distance A → B)

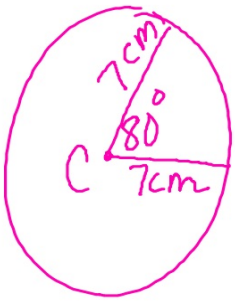
$= \frac{\theta}{360^\circ} \cdot 2\pi r = \boxed{S = r\theta}$ * θ is in radians (π)

Sector Area

$= \frac{\theta^\circ}{360^\circ} \cdot \pi r^2 = \boxed{\frac{1}{2} r^2 \theta}$

2

Example: The central angle of a sector of a circle with radius 7 cm is 80°. Find the area of the sector and the length of the arc of the sector.



$$\theta = 80^\circ \cdot \frac{\pi}{180^\circ} = \frac{4\pi}{9}$$

$$A = \frac{1}{2} r^2 \theta = \frac{1}{2}(49)\left(\frac{4\pi}{9}\right) = \frac{98\pi}{9} \text{ cm}^2$$

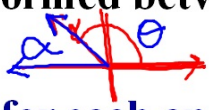
$$S = r\theta$$

$$= 7\left(\frac{4\pi}{9}\right) = \frac{28\pi}{9} \text{ cm}$$

13-3 reference angles

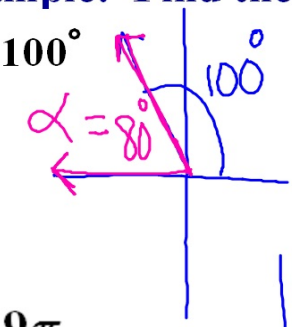
α (alpha)

A reference angle is an <u>acute</u> angle formed between the terminal side of an angle and the *x*-axis.

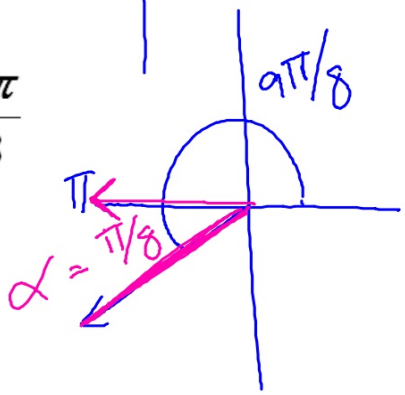


Example: Find the reference angle for each angle.

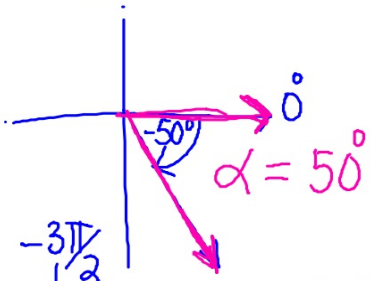
100°



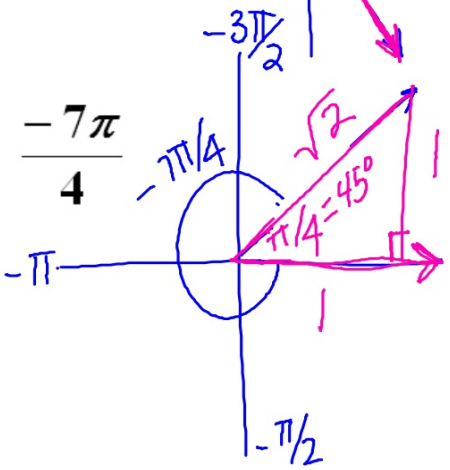
$\frac{9\pi}{8}$



-50°



$\frac{-7\pi}{4}$



$\cos 45^\circ = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$