

**Radians and Arc Length**

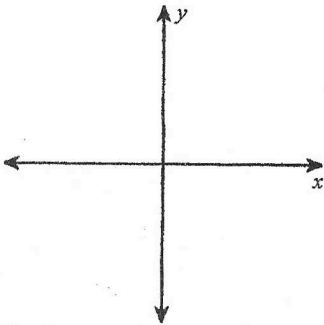
I understand how to measure angles with radians.

I can convert between radians and degrees.

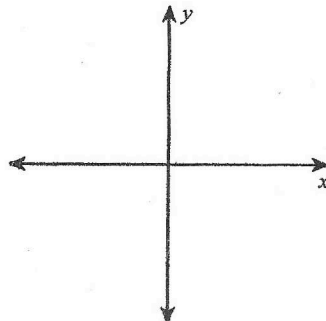
I can use the central angle and the radius to find arc length and the area of a circle.

**I understand how to measure angles with radians.****Draw an angle with the given measure in standard position.**

1)  $\frac{4\pi}{3}$



2)  $-\frac{5\pi}{4}$

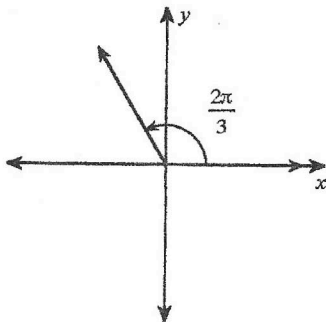
**Find a positive and a negative coterminal angle for each given angle.**

3)  $\frac{2\pi}{3}$

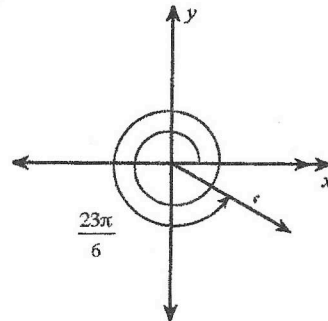
4)  $-\frac{\pi}{6}$

**Find the reference angle.**

5)



6)

**I can convert between radians and degrees.****Degree Radian Conversion:**To convert radians to degrees, multiply by  $\frac{180}{\pi}$ To convert degrees to radians, multiply by  $\frac{\pi}{180}$ **Convert each radian measure into degrees.**

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

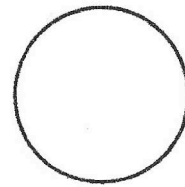
8)  $-\frac{7\pi}{6}$

**Convert each degree measure into radians.**

9)  $135^\circ$

10)  $300^\circ$

An Arc of a Circle:



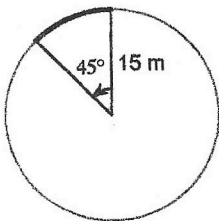
The formula for the arc length of a circle:

Arc length of a circle in radians:

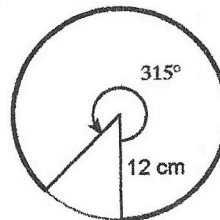
Arc length of a circle in degrees:

Find the length of each arc.

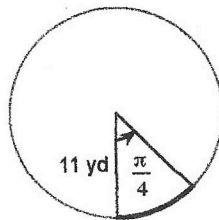
11)



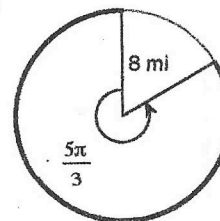
12)



13)



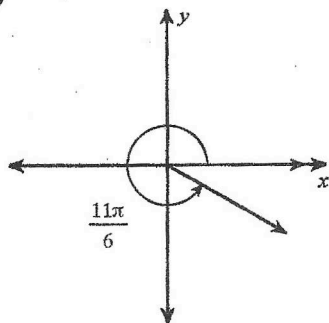
14)



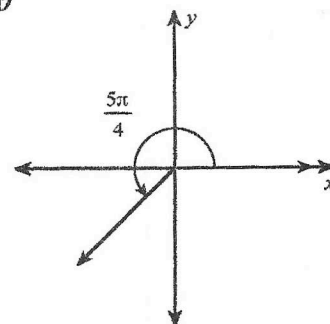
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Find the exact value of each trigonometric function.

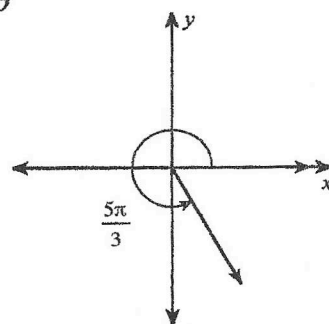
15)  $\tan \theta$



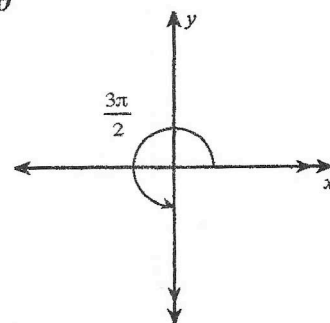
16)  $\cot \theta$



17)  $\cos \theta$



18)  $\sin \theta$



### Radians and Arc Length

I understand how to measure angles with radians.

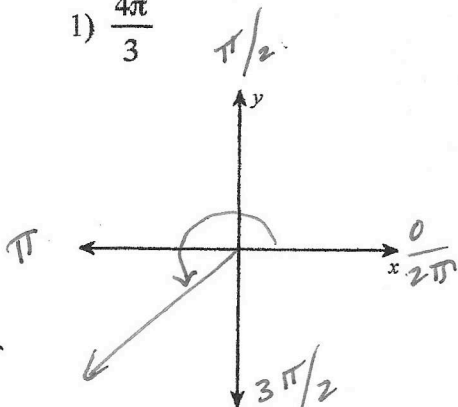
I can convert between radians and degrees.

I can use the central angle and the radius to find arc length and the area of a circle.

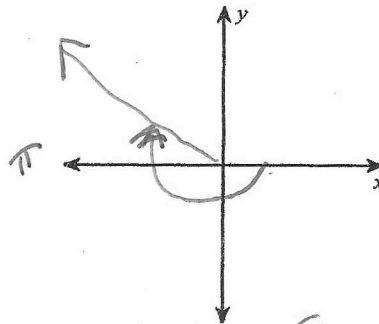
**I understand how to measure angles with radians.**

**Draw an angle with the given measure in standard position.**

1)  $\frac{4\pi}{3}$



2)  $-\frac{5\pi}{4}$



**Find a positive and a negative coterminal angle for each given angle. ( $\pm 2\pi$ )**

3)  $\frac{2\pi}{3} + \frac{6\pi}{3} = \boxed{\frac{8\pi}{3}}$

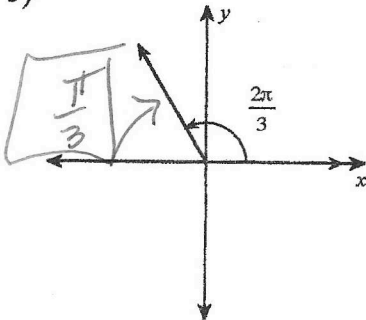
$\frac{2\pi}{3} - \frac{6\pi}{3} = \boxed{-\frac{4\pi}{3}}$

4)  $-\frac{\pi}{6} + \frac{12\pi}{6} = \boxed{\frac{11\pi}{6}}$

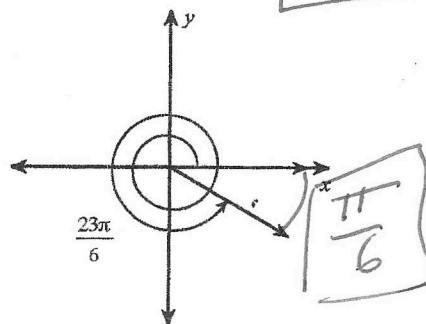
$-\frac{\pi}{6} - \frac{12\pi}{6} = \boxed{-\frac{13\pi}{6}}$

**Find the reference angle.**

5)



6)



**I can convert between radians and degrees.**

**Degree Radian Conversion:**

To convert radians to degrees, multiply by  $\frac{180}{\pi}$

To convert degrees to radians, multiply by  $\frac{\pi}{180}$

**Convert each radian measure into degrees.**

7)  $\frac{7\pi}{4} \cdot \frac{180}{\pi} = 315^\circ$

8)  $-\frac{7\pi}{6}$

**Convert each degree measure into radians.**

9)  $135^\circ \cdot \frac{\pi}{180} = \frac{3\pi}{4}$

10)  $300^\circ$

An Arc of a Circle:

a segment of the circumference.

$$\text{Circumference} = 2\pi r$$



The formula for the arc length of a circle:

Arc length of a circle in radians:

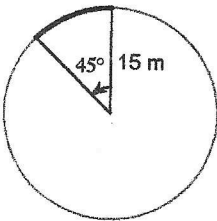
$$\theta \cdot r$$

Arc length of a circle in degrees:

$$\theta \cdot \frac{\pi}{180} \cdot r$$

Find the length of each arc.

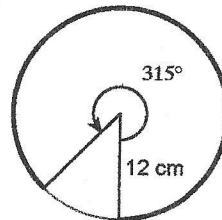
11)



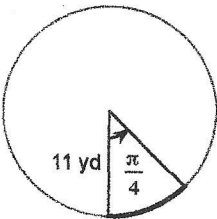
$$45 \cdot \frac{\pi}{180} = \frac{\pi}{4}$$

$$\frac{\pi}{4} \cdot 15 = \boxed{\frac{15\pi}{4}}$$

12)

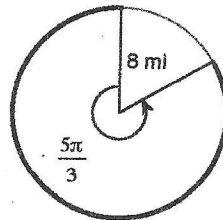


13)



$$11 \cdot \frac{\pi}{4} = \boxed{\frac{11\pi}{4}}$$

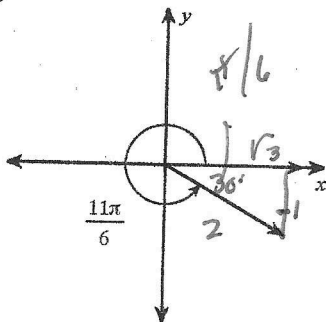
14)



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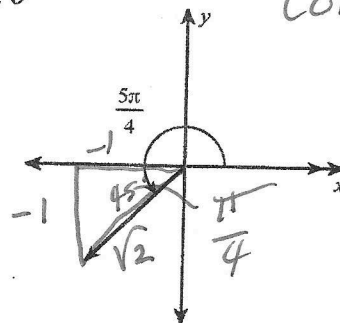
Find the exact value of each trigonometric function.

15)  $\tan \theta$



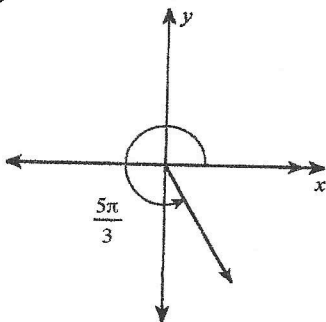
$$\tan \theta = \frac{-1}{\sqrt{3}} = \boxed{-\frac{\sqrt{3}}{3}}$$

16)  $\cot \theta$



$$\cot \theta = \frac{-1}{1} = \boxed{-1}$$

17)  $\cos \theta$



18)  $\sin \theta$

