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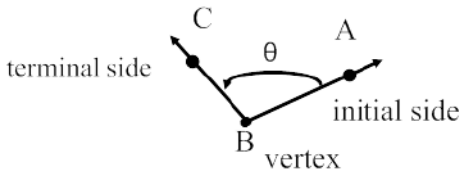
Chapter 13: Periodic Functions and Tig

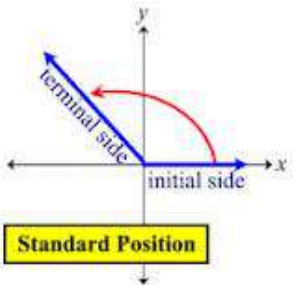
Converting Between Radian and Degree Measures

Angle: formed by two rays with a common endpoint
θ = theta



Standard Position of an Angle: an angle is in **standard position** if

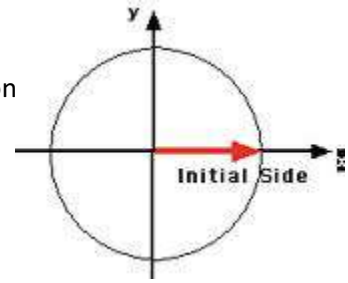
- its vertex is at the origin of a rectangular coordinate system
- its initial side lies along the positive x-axis

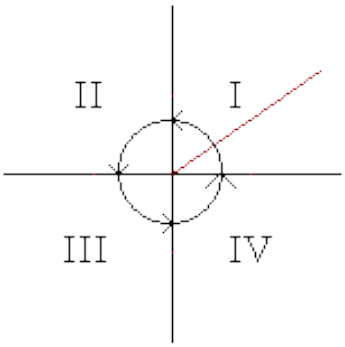


Measuring Angles in Degrees:

Note: An angle is always measured in standard position

- 0^o- 360^o is one rotation or less
- more than 360^o is more than one rotation

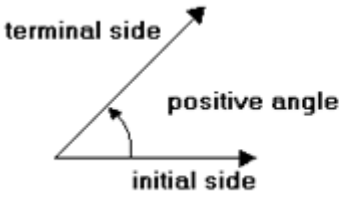


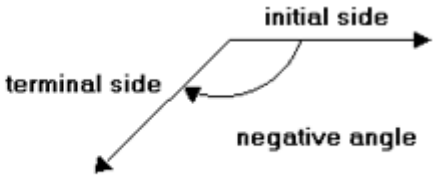


Positive Angles vs**. Negative Angles**:

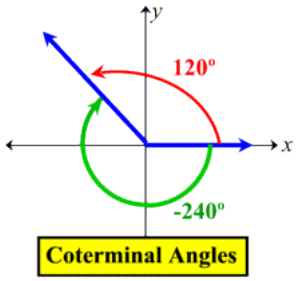
a positive angle: generated by a counterclockwise rotation.

a negative angle: generated by a clockwise rotation.





Coterminal Angles:
two angles with the same initial and terminal sides.



Sketch each angle in standard position

1) 45^oangle 2) 225^oangle 3) -135^oangle 4) 370^o angle

Determine the quadrant in which the terminal side of the angle lies

1) 210^o 2) -120^o 3) 30^o 4) 390^o

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Determine the coterminal angle for the given angle.

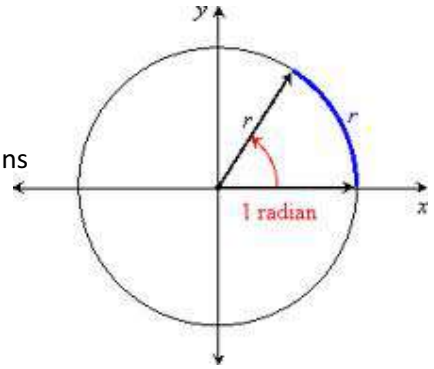
1. 60^o 2. -150^o 3. 200^o 4. 270^o 5. -80^o

Measuring in Radians: An angle made by taking the **radius** and **wrapping it along the edge** of a circle.

Note: 360^o = one time around

one time around = circumference ($C = 2\pi r$)

If radius is 1 unit then→ $360^o = 2\pi(1)$ or $360^o = 2\pi$ so $180^o = \pi$ radians



- To convert degrees to radians, multiply degrees by $\frac{\pi \text{ radians}}{180^o}$
- To convert radians to degrees, multiply radians by $\frac{180^o}{\pi \text{ radians}}$

Find the exact radian measure that corresponds to the degree measure. Give all answers in terms of π .

1) 30^o 2) 90^o 3) -135^o 4) 260^o

Find the exact degree measure that corresponds to the radian measure. If necessary, round to the nearest tenth of a degree.

1) $\frac{\pi}{3}$ 2) $-\frac{5\pi}{3}$ 3) 6π radians 4) 1.2π radians

Determine the quadrant in which the terminal side of the angle lies, then sketch the angle in standard form.

1) $\frac{\pi}{4}$ 2) $-\frac{2\pi}{3}$ 3) $-\frac{\pi}{6}$ 4) 5 radians

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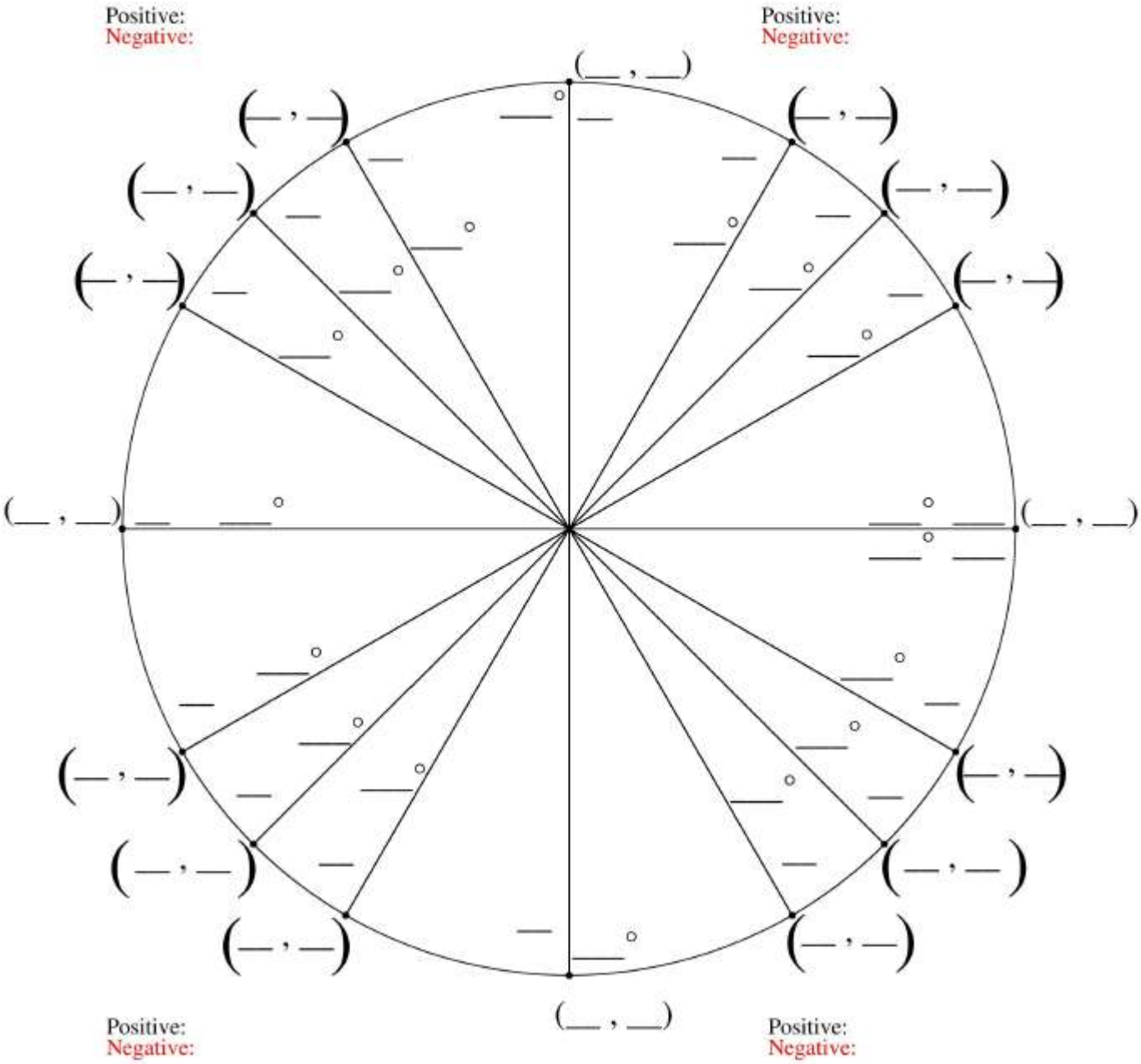
The Unit Circle



Using the Unit Circle

Use the unit circle to find the exact value of each trigonometric function.

1. $\cos 210^\circ$ **2.** $\sin(-\pi)$ **3.** $\sin 150^\circ$ **4.** $\cos 150^\circ$

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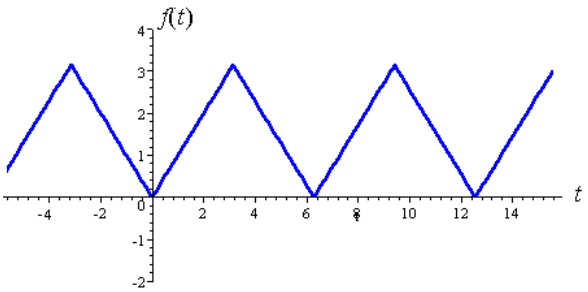
5. $\cos\frac{-2\pi}{3}$ **6.** $\cos\frac{2\pi}{3}$ **7.** $\sin\frac{11\pi}{6}$ **8.** $\cos\frac{4\pi}{3}$

Periodic functions

A periodic function repeats a pattern of y-values at regular intervals called cycles.	
The *period* of a function is the **horizontal** length on one cycle.	The *amplitude* is half the difference between the maximum and minimum values of the function.

Find the period and amplitude of each function.

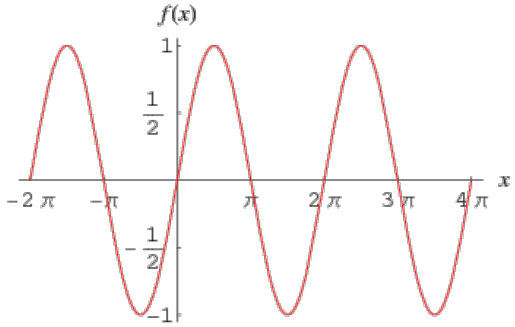
1.



Period:_____

Amplitude:_____

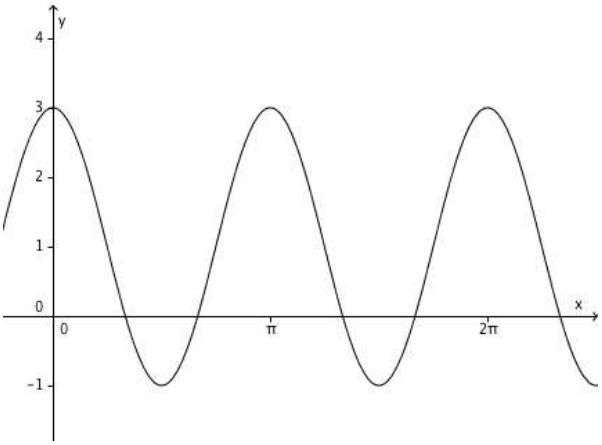
2.



Period:_____

Amplitude:_____

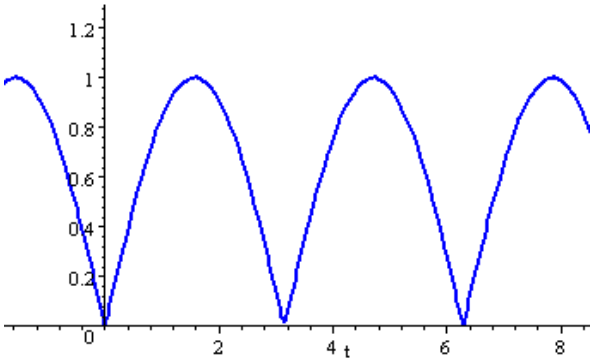
3.



Period:_____

Amplitude:_____

4.



Period:_____

Amplitude:_____