Name: SOLUTIONS

TICKET-IN-THE-DOOR

In order to be prepared for class you must watch the module and complete the following activity. This is due first thing when you get to class.

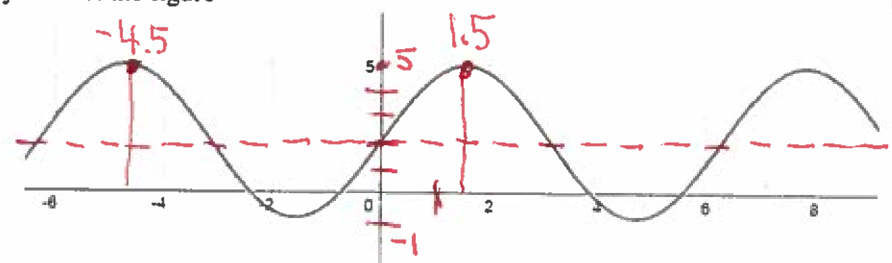
Describe the following:

- Periodic Function FUNCTIONS that repeats after every period (TRIG. FUNCTIONS)
- Period : Shortest time interval where function repeats itself. (Smallest time interval)
- Midline : The horizontal line which is the average between the max. & the min.
- Amplitude : The vertical distance between the max. and the midline or the midline & the minimum

Check your understanding:

1. Determine the midline, period and amplitude and the minimum and maximum values of the function below. Make sure you label the figure
   a)

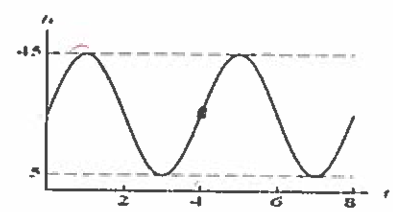
Period: $|-4.5-1.5|$ $=|-6| = \boxed{6}$



Midline: $\frac{5+(-1)}{2} = \frac{4}{2}$ $\boxed{y=2}$

Amplitude $= |5-2|$ $= \boxed{3}$

2. The graph to the right shows your height $h = f(t)$ in meters t minutes after a ferris wheel ride begins.



   a. How many meters is the radius of the ferris wheel?

   Sol Diameter = 40 ⇒ Radius = $\frac{1}{2}$

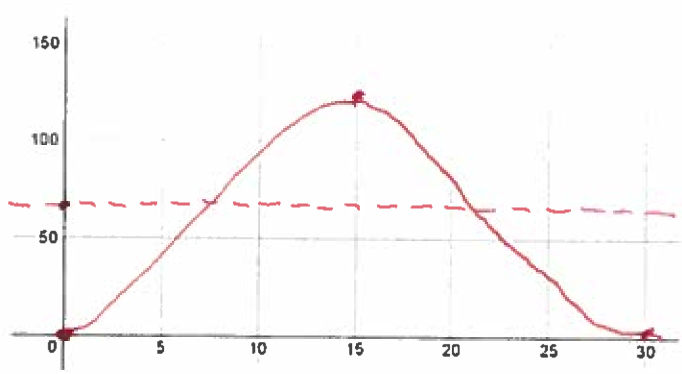
   b. How long is one rotation of the ferris wheel?

   Sol 4 minutes

3. The London ferris wheel is 135 meters in diameter and makes one revolution every 30 minutes. Let $y = h(t)$ be the height above ground after t minutes of riding. Graph the function y = h(t). Label the period, the amplitude and the midline.

Midline: $\frac{135-0}{2} = 67.5$

$\boxed{y=67.5}$



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In order to be prepared for class you must watch the module and complete the following activity. This is due first thing when you get to class.

The unit circle has a radius of 1 unit.

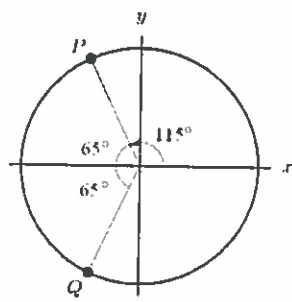
Suppose P = (x,y) is a point on the unit circle defined by θ, then x = $\cos\theta$ and y = $\sin\theta$

Check your understanding:

$x = r\cos\theta$
$y = r\sin\theta$

1. Find the coordinates of the point at the given angle on a circle with radius 3.8 centered at the origin.
   a. $90° = (3.8\cos 90°, 3.8\sin 90°) = (0, 3.8)$
   b. $180° = (3.8\cos 180°, 3.8\sin 180°) = (-3.8, 0)$
   c. $-270° = (3.8\cos(-270°), 3.8\sin(-270°)) = (0, 3.8)$
   d. $-540° = (3.8\cos(-540°), 3.8\sin(-540°)) = (-3.8, 0)$

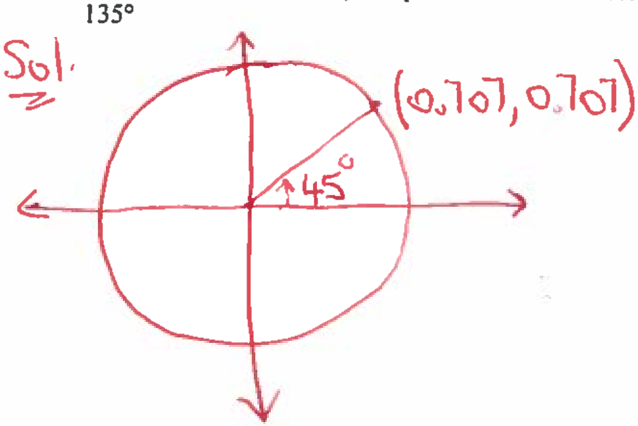
2. In the following figure, the circle shown is the unit circle. Find the coordinates of $P(x,y)$. Round your answer to 3 decimal places



Sol: $x = \cos 115° = -0.423$
$y = \sin 115° = 0.906$

3. Given P ≈ (0.707, 0.707) is a point on the unit circle with angle 45°, estimate sin 135° and cos 135°

Sol.



$\sin 135° = \sin 45° \boxed{= 0.707}$

$\cos 135° = -\cos 45° \boxed{= -0.707}$

Name: SOLUTIONS

TICKET-IN-THE-DOOR

In order to be prepared for class you must watch the module and complete the following activity. This is due first thing when you get to class.

List the conversion ratios needed to convert between radians and degrees. $1^\circ = \frac{\pi}{180}$ radians & 1 radian $= \frac{180^\circ}{\pi}$

The arc length, s, spanned in a circle with radius r is given by s = $r\theta$

θ is in radians

Check your understanding:

1. Without a calculator, what is the exact value of $\cos\left(\frac{2\pi}{3}\right)$?

$\frac{2\cancel{\pi}}{\cancel{3}_1} \cdot \frac{\cancel{180}^{60}}{\cancel{\pi}} = 120^\circ \quad \cos\left(\frac{2\pi}{3}\right) = \cos(120^\circ) = \boxed{-\frac{1}{2}}$

2. What is the reference angle for $-\frac{5\pi}{4}$?

Sol: $\boxed{\frac{\pi}{4}}$

3. The arc length corresponding to 330° on a circle of radius 3 is $\frac{11}{2}$ π.

Sol: $s = r\cdot\theta = (3)(330^\circ)\cdot\frac{\pi}{180} = \frac{99\cancel{0}}{18\cancel{0}}\pi = \boxed{\frac{11}{2}\pi}$

4. The angle 270° is equivalent to $\cancel{3/2}$ π radians.

Sol: $27\cancel{0}\cdot\frac{\pi}{18\cancel{0}} = \frac{3\pi}{2}$

5. 0.75 rotations around the unit circle corresponds to 1.5 π radians.

Sol: $0.75\cdot 2\pi = \frac{75}{100}\cdot 2\pi = \frac{75}{50}\pi = \frac{3}{2}\pi = 1.5\pi$

6. What is the length of an arc cut off by an angle of 210° in a circle of radius 2.4 meters? Give your answer correct to 3 decimal places.

Sol: $s = r\cdot\theta$

$s = 2.4(21\cancel{0})\cdot\frac{\pi}{18\cancel{0}} = \frac{(21)(2.4)(\pi)}{18} = \boxed{8.796}$

Name: SOLUTIONS

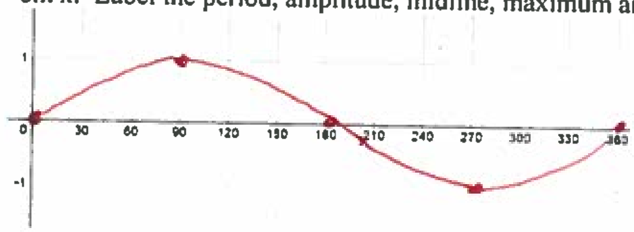
Chapter 7 - Section 7.4 Graphs of Sine and Cosine

TICKET-IN-THE-DOOR

In order to be prepared for class you must watch the module and complete the following activity. This is due first thing when you get to class.

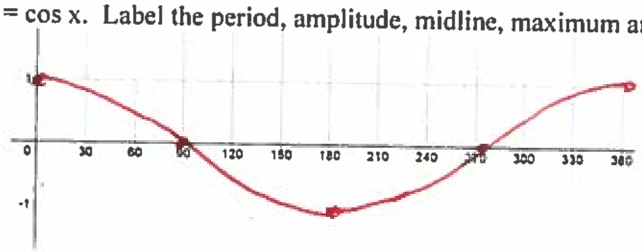
Check your understanding:

1. Graph the function y = sin x. Label the period, amplitude, midline, maximum and minimum.



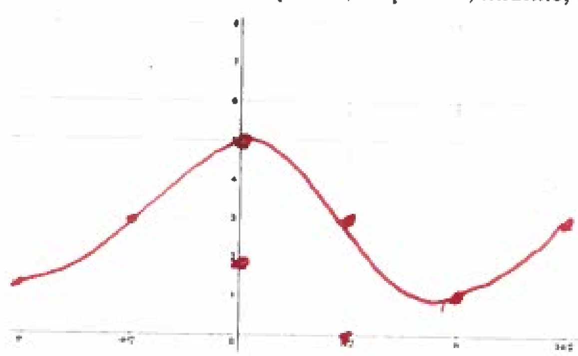
Period: 360°
Amplitude: 1
Midline: y=0
Max: 1
Min: -1

2. Graph the function y = cos x. Label the period, amplitude, midline, maximum and minimum.



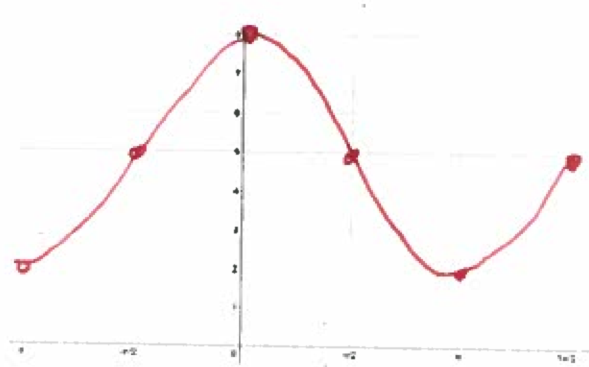
Period = 360°
Amplitude = 1
Midline: y=0
Max: 1
Min: -1

3. Graph the function y = 2 cos x+3. Label the period, amplitude, midline, maximum and minimum.



Period: 2π
Amplitude: 2
Midline: y=3
Max: 5
Min: 1

4. Graph the function y = 3 cos x+5. Label the period, amplitude, midline, maximum and minimum.



Period: 2π
Amplitude: 3
Midline: y=5
Max: 8
Min: 2