

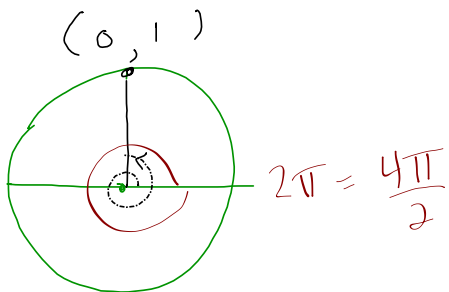


HW Help → → →

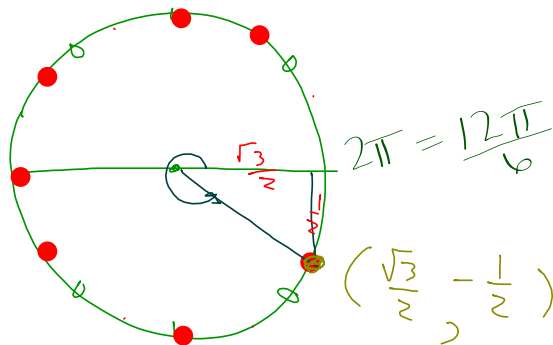
- Pick up the Warm up

①  $\tan\left(\frac{5\pi}{2}\right) = \frac{1}{0} \Rightarrow \text{undef.}$

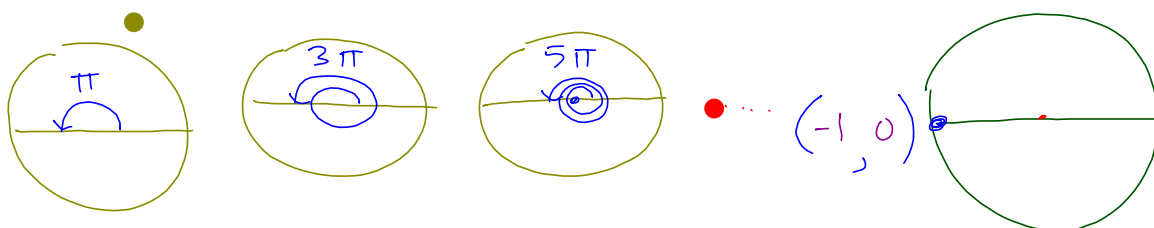
②  $\sin\left(\frac{11\pi}{6}\right) = \frac{-1}{2}$



$$= \frac{\sin\left(\frac{5\pi}{2}\right)}{\cos\left(\frac{5\pi}{2}\right)} = \frac{1}{0} = \text{undef.}$$



$$\textcircled{3} \quad \cos(201\pi) = -1$$



$$\textcircled{4} 88.8^\circ \times \frac{2\pi}{360^\circ} = \underline{1.55} \text{ radians}$$

5

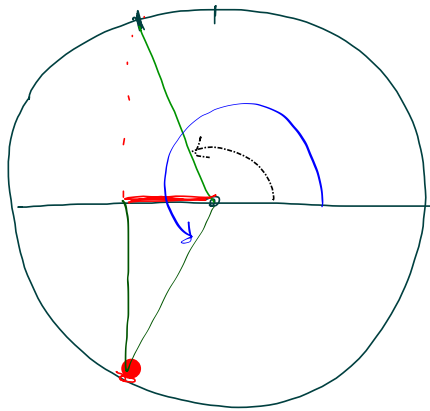
Convert from radians to degrees.

$$\frac{2\pi}{13}$$

$$\frac{2\pi}{13} \times \frac{360^\circ}{2\pi}$$

$$\frac{\cancel{2\pi}}{13} \times \frac{360^\circ}{\cancel{2\pi}} = \frac{360^\circ}{13} \approx \underline{\underline{27.69^\circ}}$$

- ⑥ Find another rotation angle that produces the same cosine value as  $100^\circ$ .



Same cosine  
value



$$\theta' = 180^\circ - 100^\circ$$

$$\theta' = 80^\circ$$

2<sup>nd</sup> Angle with same cosine

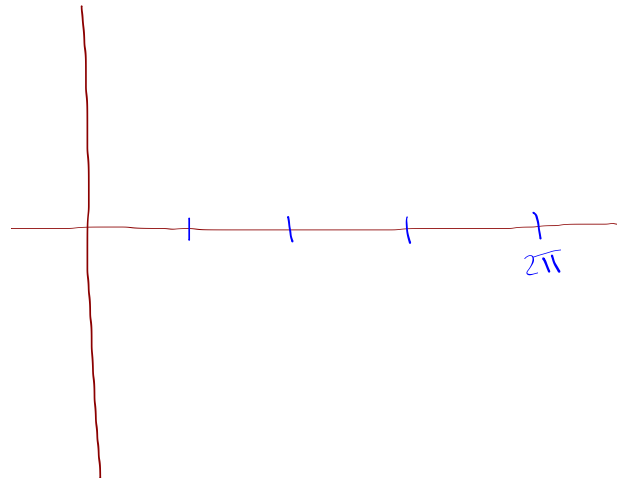
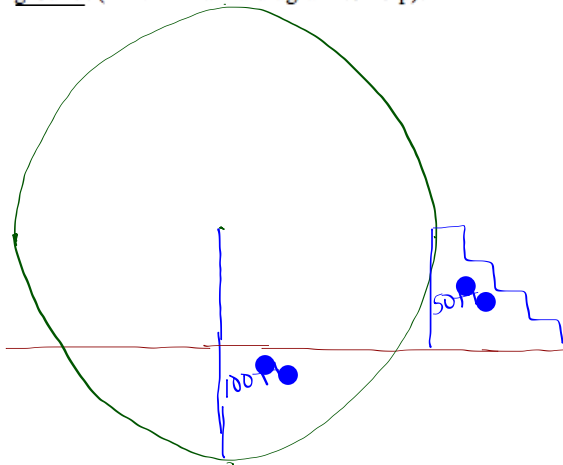
in Quadrant III

$$180^\circ + 80^\circ = \boxed{260^\circ}$$

1.

The Amusement Park has decided to imitate *The Screamer* but wants to make it even better. Their ride will consist of a circular track with a radius of 100 feet, and the center of the circle will be 50 feet ABOVE ground. *It will be called the Screamer Plus.* Passengers will board at the normal spot which will now be 50 feet above ground (riders will climb up stairs to board another words).

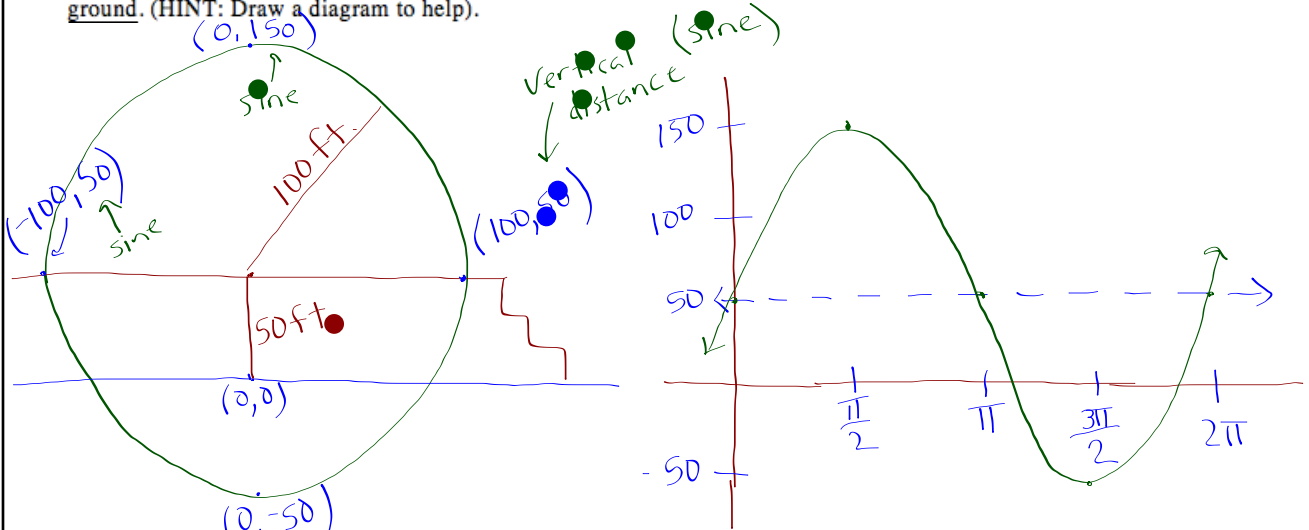
Write a function that relates the angle traveled from the starting point to the height of the rider above or below the ground. (HINT: Draw a diagram to help).



1.

The Amusement Park has decided to imitate *The Screamer* but wants to make it even better. Their ride will consist of a circular track with a radius of 100 feet, and the center of the circle will be 50 feet ABOVE ground. *It will be called the Screamer Plus.* Passengers will board at the normal spot which will now be 50 feet above ground (riders will climb up stairs to board another words).

Write a function that relates the angle traveled from the starting point to the height of the rider above or below the ground. (HINT: Draw a diagram to help).



$a = 100$   
 $\text{Per} = 2\pi$   $b = 1$   
 $h = 0$   
 $k = 50$

$$y = 100 \sin(x) + 50$$



HW  
Questions

Answers for  
Buffalo Problem

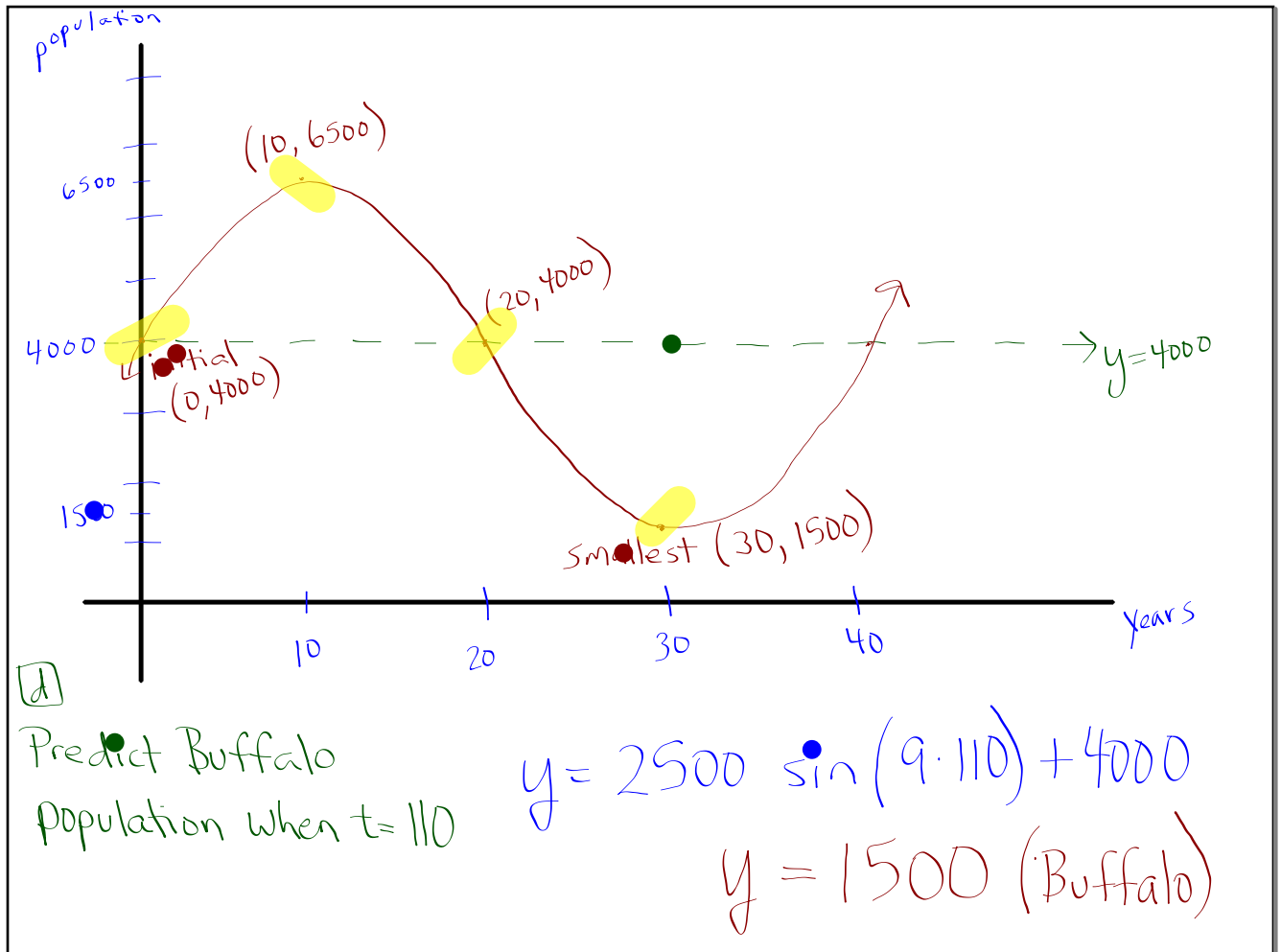


The population of water buffalo is given by the function

$$P(t) = 4000 + 2500 \sin(9t)$$

*where  $t$  = number of years since the first population estimate was made*

- a) What was the initial estimate of the buffalo population ?
- b) What was the size after
  - 10 years ?
  - 20 years ?
- c) Find the smallest population and when it first occurs.
- d) Predict the population in 110 years.



162 ANSWERS

(a)

$$-\frac{\sqrt{2}}{2}$$

(b)

$$\sqrt{3}$$

(c)

$$-\frac{1}{2}$$

(d)

$$\sqrt{2}/2$$

(e)

$$1$$

(f)

$$-\frac{\sqrt{3}}{3} \text{ or } -\frac{1}{\sqrt{3}}$$

(g)

$$\pi/4 \text{ and } 5\pi/4$$

(h)

$$3\pi/4 \text{ and } 7\pi/4$$

160) Write an equation

Amplitude : 7

Per :  $8\pi$

Sketch it

$$y = 7 \sin\left(\frac{1}{4}\theta\right)$$



162

G

$$\tan(\theta) = 1$$

H

$$\tan(\theta) = -1$$

$$y = 4\sin(6x)$$

$$\text{Per} = \frac{2\pi}{6}$$

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

166

2 bdrm  
House  
Seattle

\$ 400,000

in 2005

3.5%

a) in 2015 ?

b) when 800,000 ?

$$800000 = 400000 (1.035)^x$$



(c) Jacksonville  
200,000 now  
2% depreciation

How much will it lose  
in 10 years?

ANSWER

166 a) \$546,240

b) In about 2025

c) About \$36,585.

Tips on Exam

Be familiar with what is on your reference sheet which you can use on Part 2 of the test.

Remember the

Pythagorean Identity

$$\cos^2(\theta) + \sin^2(\theta) = 1$$

(it is on your  
reference  
sheet)

**If graphing a cyclic function on your  
GDC....**

**start with ZOOM 7, then adjust window  
paying attention to the mode you are  
in.**


*↑ radian*

**graph the midline separately, say in  $Y_2$**

# Agenda

① Practice with Periodic Graphing  
Graphs  $\leftrightarrow$  Equations

Check  
answers as  
you go

 Review 1 (worksheet + Textbook)

 Add To Recording Sheet

 .

## Trigonometry Joke

**What is the sign of 40 ?**

**"When I was your age ....."**

Practice

Periodic  
Graphs



Their  
Functions

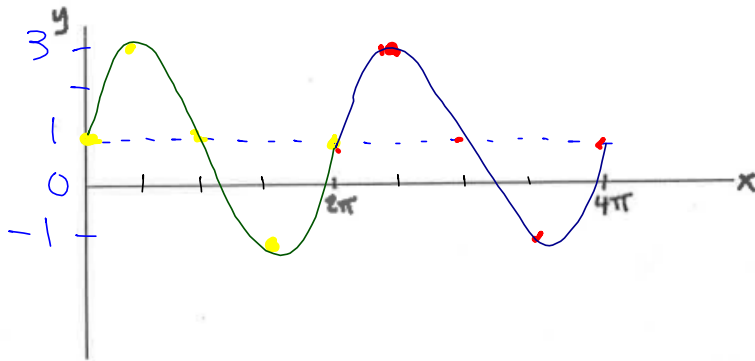
Get used to using  
your reference sheet



(A) Without using a calculator, identify the following for each of the two cyclic functions. Then sketch the graph.

$$y = 2 \sin(x) + 1$$

Amplitude = 2  
 Period =  $\frac{2\pi}{1} = 2\pi$   
 Horizontal shift constant,  $h = 0$   
 the vertical shift constant,  $k = 1$



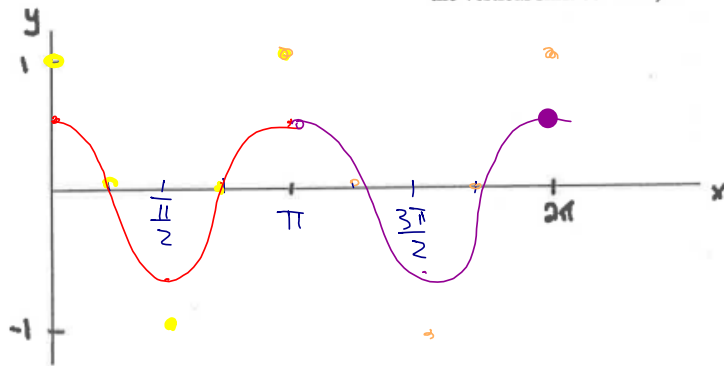
$$y = \frac{1}{2} \cos(2x)$$

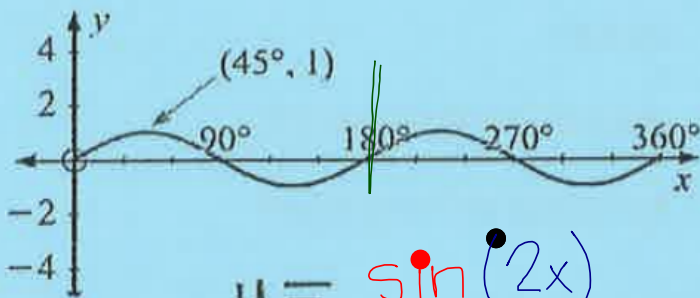
Amplitude =  $\frac{1}{2}$

Period =  $\frac{2\pi}{2} = \pi$

Horizontal shift constant,  $h = 0$

the vertical shift constant,  $k = 0$





$$y = \sin(2x)$$

Amplitude = 1

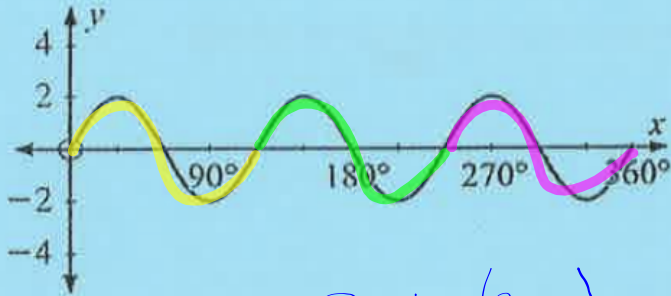
Period =  $180^\circ$ , so  $b = \frac{360^\circ}{180^\circ} = 2$

Horizontal shift constant,  $h = 0$

the vertical shift constant,  $k = 0$

$$\text{Per} = \frac{2\pi}{b}$$

$$b = \frac{2\pi}{\text{Per}} \quad \frac{360}{180}$$



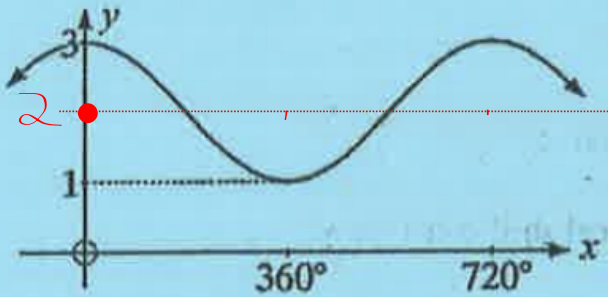
$$y = 2 \sin(3x)$$

Amplitude = 2

Period = 120°, so  $b = 3$

Horizontal shift constant,  $h = 0$

the vertical shift constant,  $k = 0$



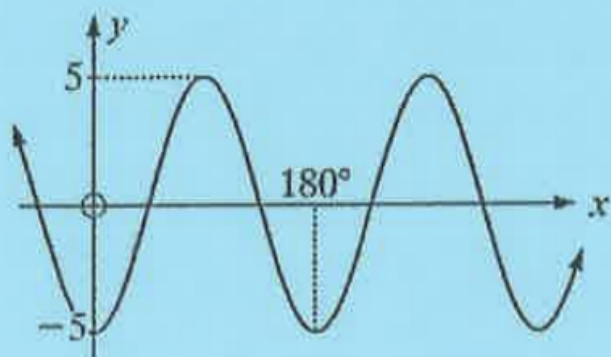
Amplitude = 1

Period =  $720^\circ$ , so  $b = \frac{1}{2}$

Horizontal shift constant,  $h = 0$

the vertical shift constant,  $k = 2$

$$y = \cos\left(\frac{1}{2}x\right) + 2$$



Amplitude = 5

Period =  $180^\circ$ , so  $b = 2$

Horizontal shift constant,  $h = 0$

the vertical shift constant,  $k = 0$

$$y = -5 \cos(2x)$$

When finished, start  
Review Assignment #1

**a handout**

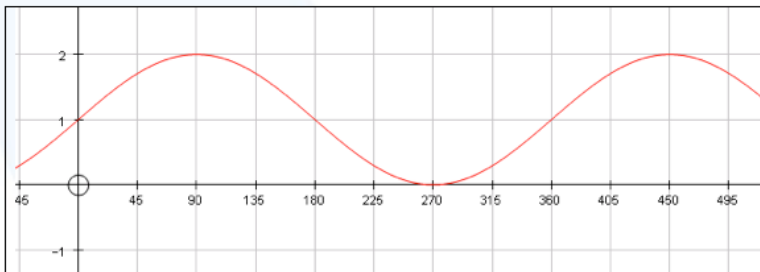
optional  
Matching  
exercise



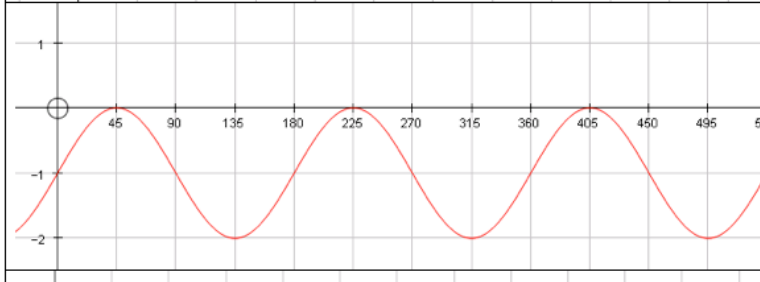
match the following graphs to the functions

$y = 3\sin 0.5x$	$y = -2\sin x$	$y = 2\sin 3x$	$y = 2\cos x$	$y = 2\sin 2x - 2$
$y = -\cos 3x$	$y = 2\cos 2x - 1$	$y = \cos x$	$y = \sin x + 1$	$y = -\cos x + 1$
$y = \cos 0.25x$	$y = \sin 2x - 1$	$y = -\sin 4x + 1$	$y = 2\cos x - 1$	$y = \sin x$

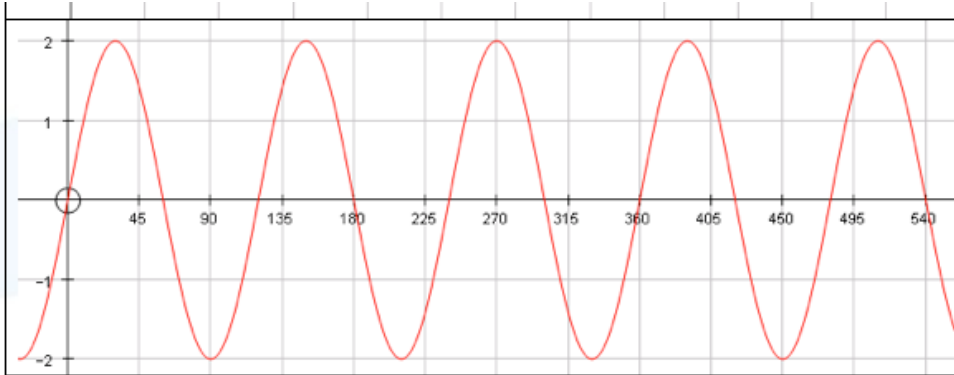
A



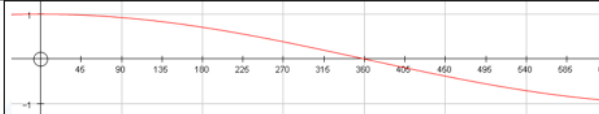
B



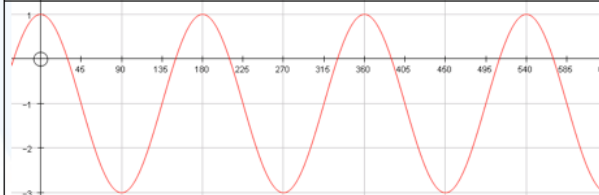
C



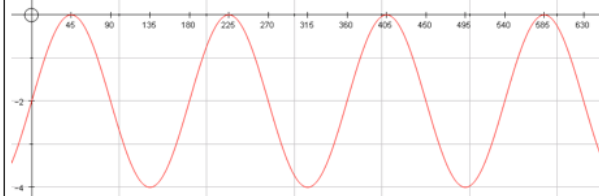
D



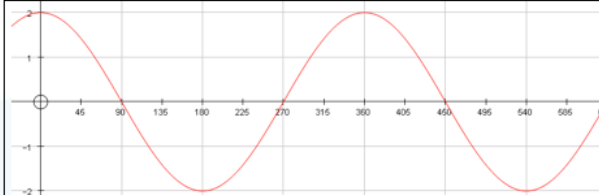
F



T

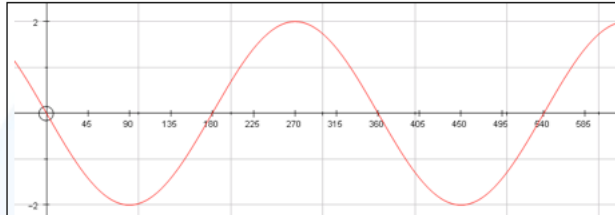


G

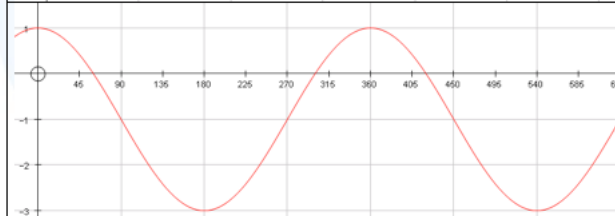


G

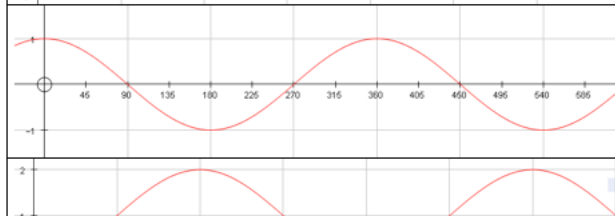
H



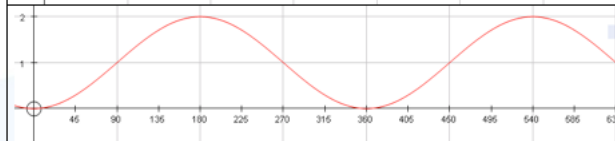
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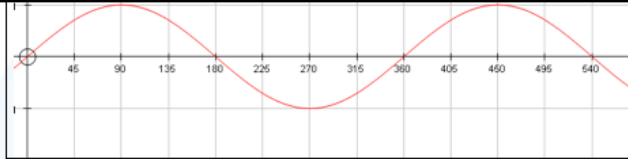
J



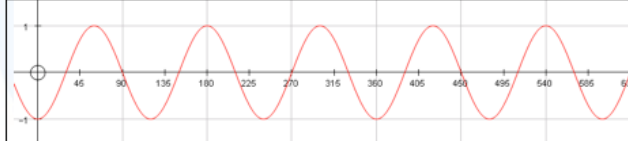
K



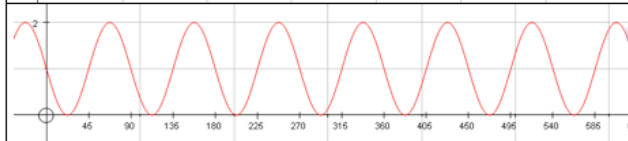
L



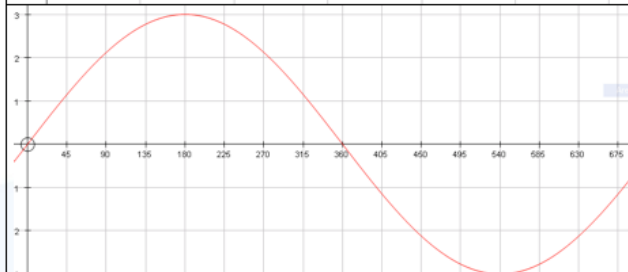
M



N



P



1

Graph each function, finding the requested

$y = \sin x$

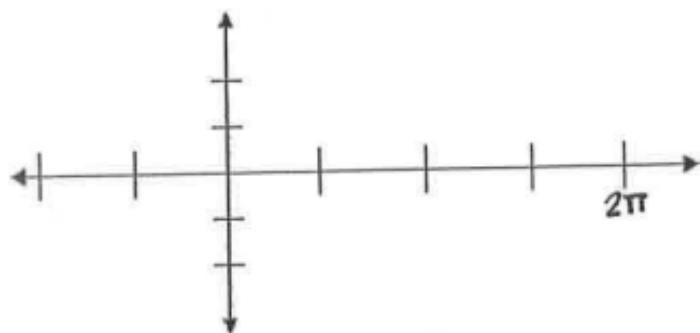
Domain \_\_\_\_\_

x-ints \_\_\_\_\_

Range \_\_\_\_\_

y-int \_\_\_\_\_

Period \_\_\_\_\_



b)  $y = \cos x$

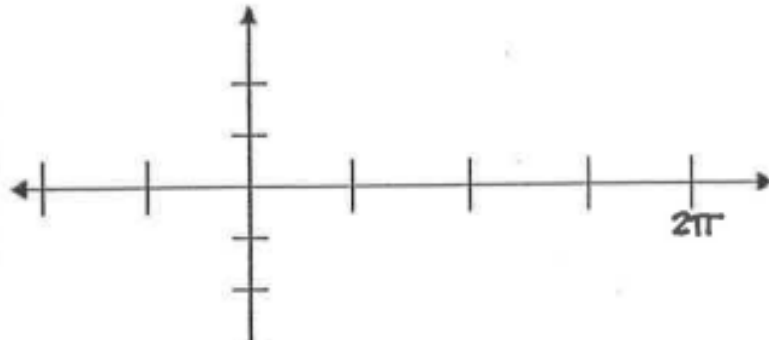
Domain \_\_\_\_\_

x-ints \_\_\_\_\_

Range \_\_\_\_\_

y- int \_\_\_\_\_

Period \_\_\_\_\_



c)

$$y = \tan x$$

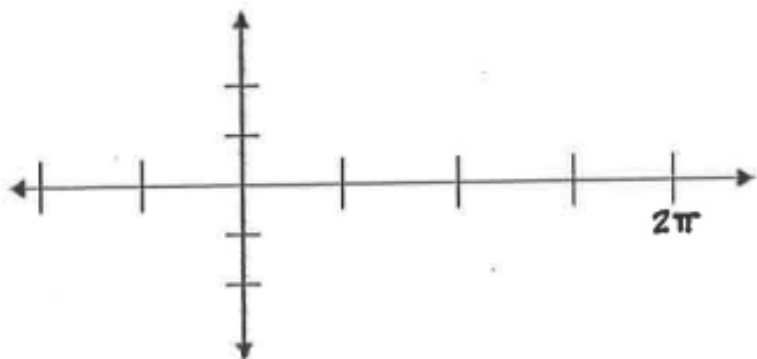
Domain \_\_\_\_\_

x-ints \_\_\_\_\_

Range \_\_\_\_\_

y-int \_\_\_\_\_

Period \_\_\_\_\_





2 Write an equation of a cosine function with amplitude 3, a period of  $\pi$ , a phase shift of  $\frac{\pi}{4}$

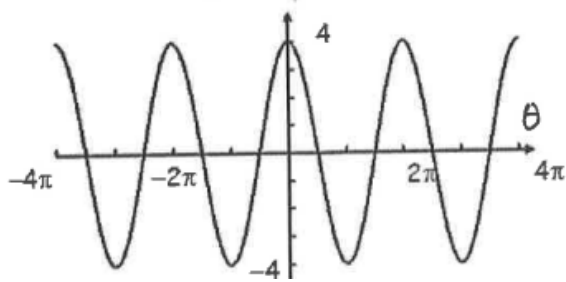
a) to the left, and translated 1 unit up.

b) Write an equation of a sine graph with a phase shift right 3, a period of  $5\pi$ , a vertical translation down 6, and an amplitude of 3.

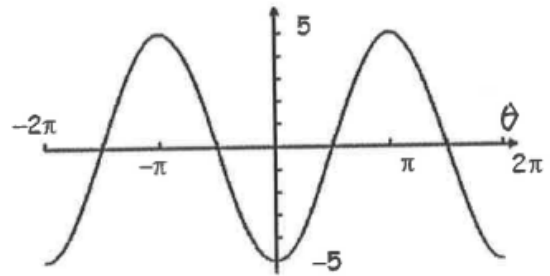
3

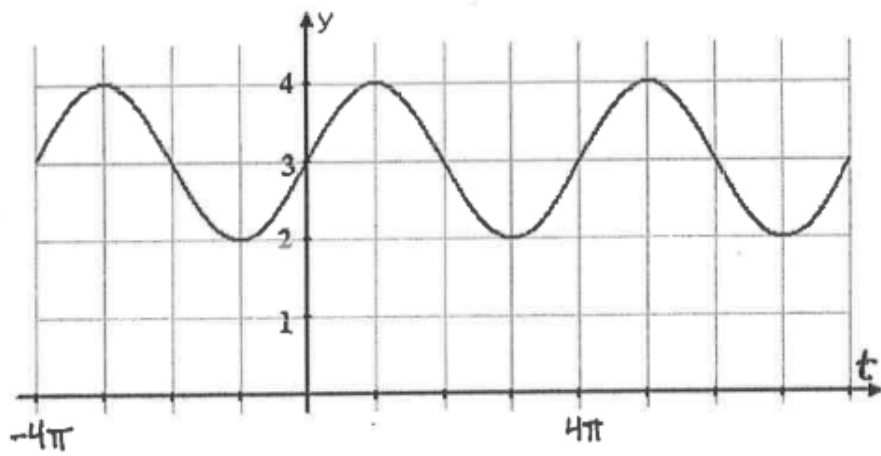
Given the graph, find the amplitude and period, then write a trig function.

a)



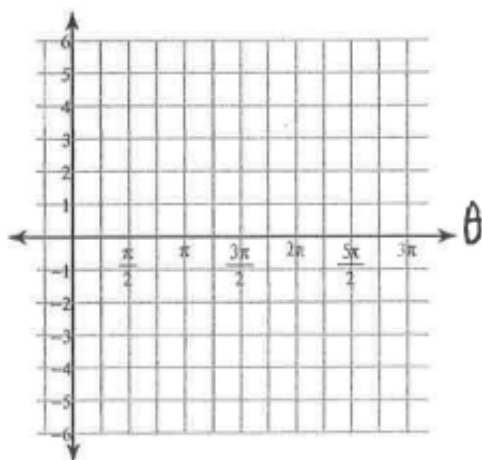
b)





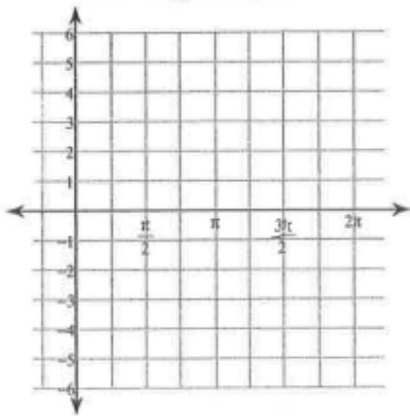
4 Graph  $y = 2 \sin(\theta) + 3$

(A)



Graph  
 $y = 2 \cos(2\theta) - 2$

(B)



2.

A year after the *Screamer Plus*, they plan to build the **Screamer Dungeon**. Their ride will consist of a circular track with a radius of 150 feet, and the center of the circle will be 50 feet BELOW ground. Passengers will board and start 50 feet below ground but at the location (riders will climb down to board).

Write a function that relates the angle traveled *from the starting point* to the height of the rider above or below the ground. (HINT: Draw a diagram to help).

Textbook Questions  
do on Separate Paper

7

~~146~~, 148, 150a, 170

141ab

↑ Practice for  
exact values of  
sine, cosine, and tangent

