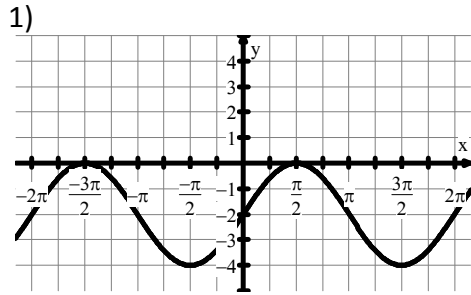Name: _____ Date:_____ Period: _____ **ID: 2**
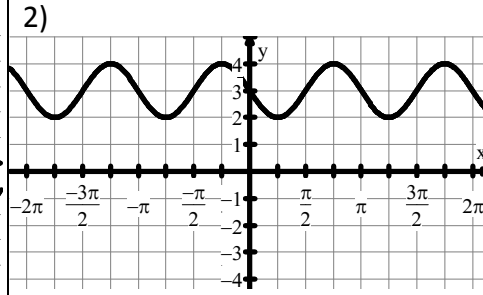
Unit 10 Corrective Assignment – Graphing Trig Functions

Pre-Calculus

For 1-3, write a <u>SINE</u> function for each graph. If needed use a phase shift, not a negative coefficient.

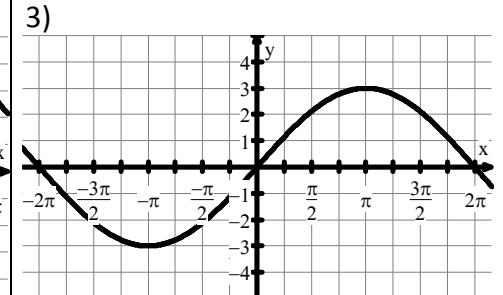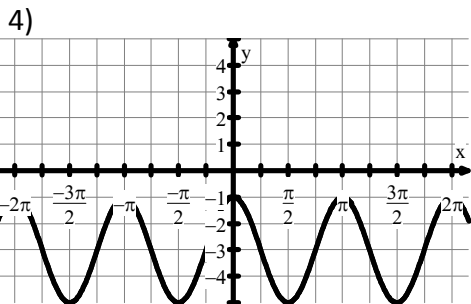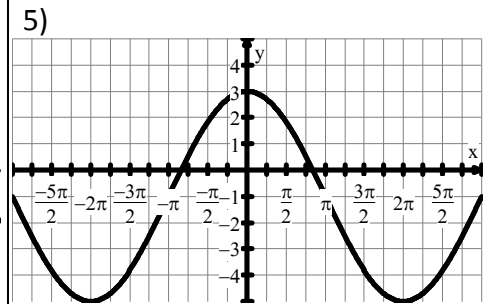| 1)	2)	3)
$y =$	$y =$	$y =$

For 4-6, write a <u>COSINE</u> function for each graph. If needed use a phase shift, not a negative coefficient.
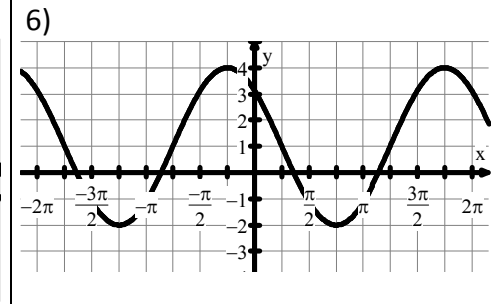
4)	5)	6)
	$y =$	$y =$
$y =$		

7) Write the equation of a **<u>sine</u>** curve with the following transformations:

- Move down 5
- Move right $\dfrac{\pi}{7}$

$y =$

8) Write the equation of a **<u>cosine</u>** curve with the following transformations:

- One full period occurs 5 times between 0 and 2π.
- Vertical shift up 1.

$y =$

For 9-10, state the amplitude, period, phase shift, and vertical shift.

9) $y = 2\sin(\pi x - \pi) - 2$

amp =   period =

p.s. =   v.s. =

10) $y = 4 - 3\cos 5x$
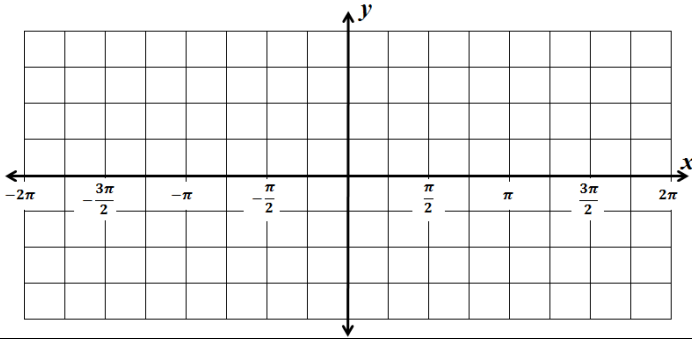
amp =   period =
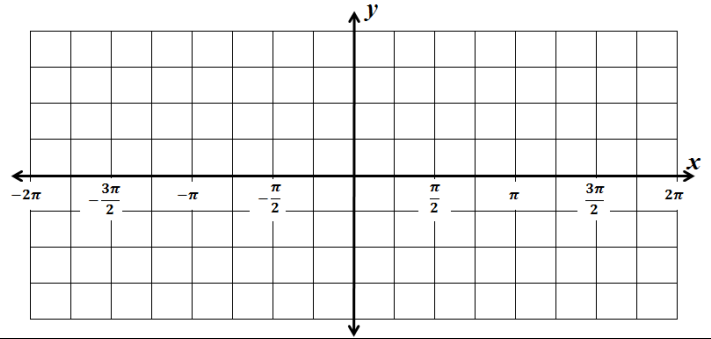
p.s. =   v.s. =

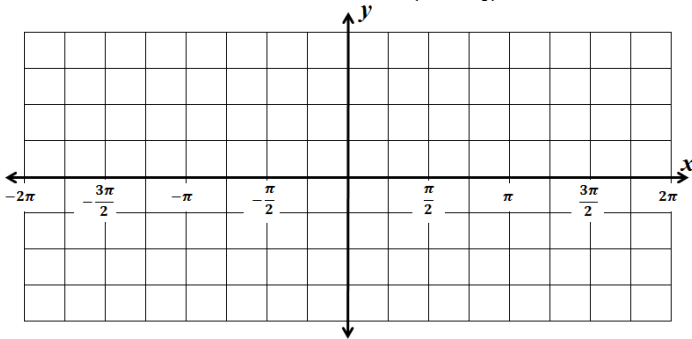For 11-18, graph the function. Use the entire grid left to right.
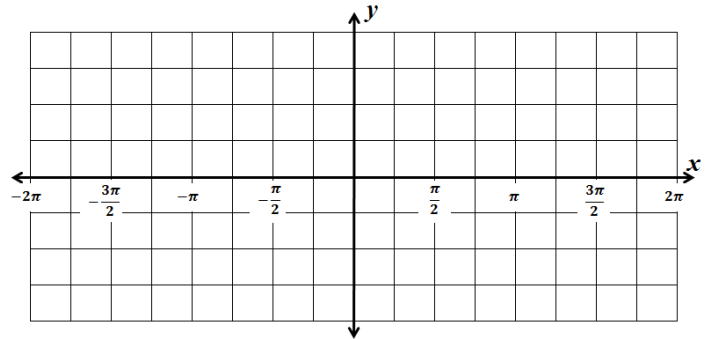
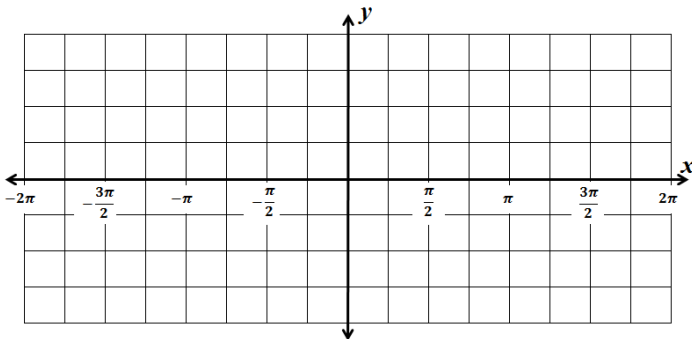11) $y = 2 \sin x + 2$

12) $y = -3 \cos x$

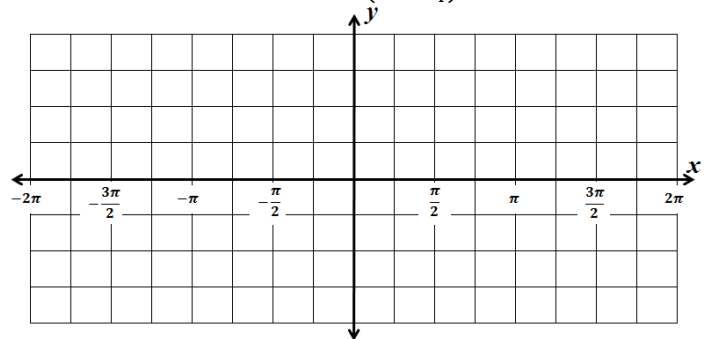13) $y = -2 \sin\left(x - \dfrac{\pi}{4}\right)$

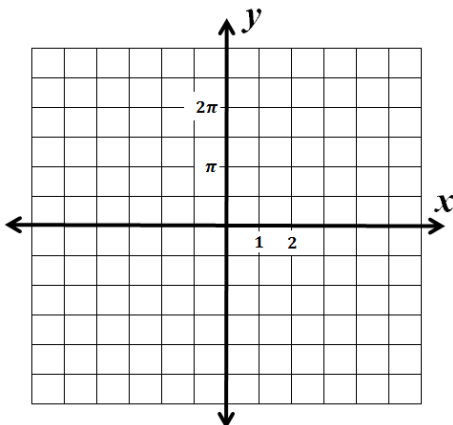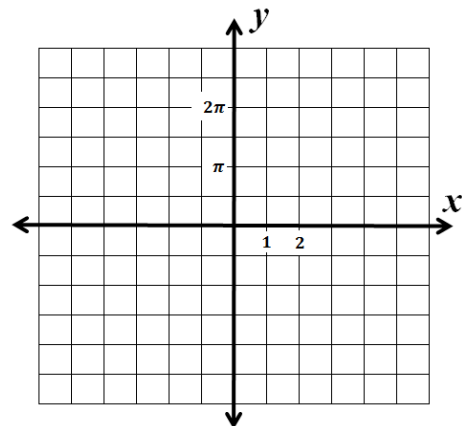14) $y = 2 \cos(2x + \pi) - 1$

15) $y = 2 \sec x$

16) $y = \tan\left(x + \dfrac{\pi}{4}\right) + 1$

17) $y = 3 \sin^{-1}(x - 2)$

18) $y = 2 \tan^{-1}(x + 3)$

For 19 – 21, find the exact value of the expression.

19) $\sin\left(\arccos\left(\frac{\sqrt{3}}{2}\right)\right)$

20) $\cos(\arctan(0))$

21) $\tan\left(\sin^{-1}\left(\frac{1}{2}\right)\right)$

For 22 – 24, find the approximate value by using a calculator. Use degree mode.

22) $\sec^{-1}\left(\frac{7}{5}\right)$

23) $\csc(75°)$

24) $\cot^{-1}(4)$

For 25 – 27, use a reference triangle to find the exact value of the expression. Draw a triangle!

25) $\cos\left(\tan^{-1}\left(\frac{8}{3}\right)\right)$

26) $\csc\left(\text{arcsec}\frac{9}{5}\right)$

27) $\sin(\csc^{-1} 5)$ hint: $5 = \frac{5}{1}$

28) Superman and the Hulk are playing baseball. The Hulk throws a fast ball to Superman and it is hit straight up in the air. Hulk is standing 150 feet from Superman when the ball is hit.   Assuming the ball never comes back down, **write a model** that represents the angle of elevation (from Hulk's perspective) as a function of the height of the ball.

29) A tennis ball is dropped off a 410 foot skyscraper. You are standing 15 feet from the building watching it fall with binoculars. Assuming the ball falls in a direct line, **write a model** that represents the <u>distance</u> from the top of the building as a function of the <u>angle</u> of elevation.

30) After getting knocked off his boogie board, Mr. Kelly watches it float up and down on the ocean waves. The board moves 6.8 feet from its low point to its high point, returning to its low point every 7 seconds.

a) Write an equation that gives the board's vertical position y at time t if the board is at its lowest point when $t = 0$.

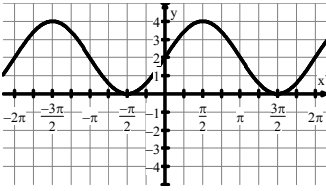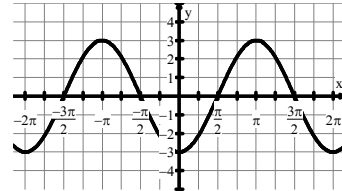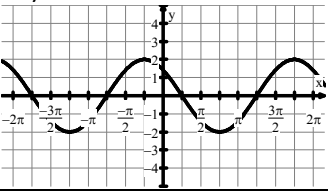b) Explain why you chose $y = a\sin(bt)$ or $y = a\cos(bt)$ for part a.

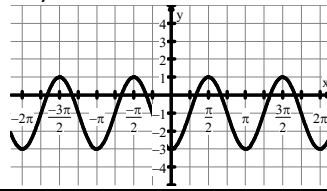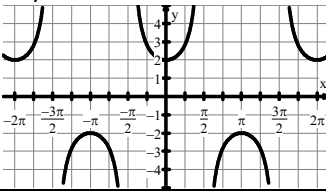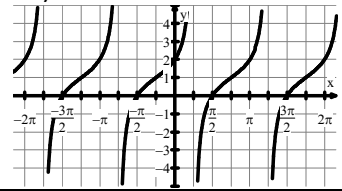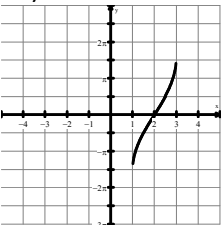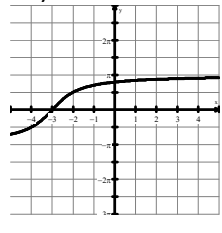31) Suppose you are riding a Ferris wheel. After everyone is loaded, the wheel starts to turn and the ride lasts for 150 seconds. Your height h (in feet) above the ground at any time t (in seconds) can be modeled by the equation

$$h(t) = 55 \sin\left[\frac{\pi}{30}(t - 10)\right] + 63.$$

a. What is the period?

b. What does the period represent in this scenario?

c. What is the frequency?

d. What does the frequency represent in this scenario?

e. What is your maximum height?

f. What is your minimum height?

g. How many circles will the Ferris Wheel make during the ride?

h. How high are you when the ride begins? (Use radians.)

i. What is your height when the ride stops?

Answers to Unit 10 Corrective Assignment

1) $y = 2\sin(x) - 2$	2) $y = \sin(2x - \pi) + 3$	3) $y = 3\sin\left(\frac{1}{2}x\right)$	4) $y = 2\cos(2x) - 3$
5) $y = 4\cos\left(\frac{1}{2}x\right) - 1$	6) $y = 3\cos\left(x + \frac{\pi}{4}\right) + 1$	7) $y = \sin\left(x - \frac{\pi}{7}\right) - 5$	8) $y = \cos(5x) + 1$
9) amp = 2; period = 2; p.s. = right 1; v.s. = down 2	10) amp = 3; period = $\frac{2\pi}{5}$; p.s. = none; v.s. = up 4	11)	12)
13)	14)	15)	16)

17)	18)	19) $\frac{1}{2}$	20) 1	21) $\frac{\sqrt{3}}{3}$	22) $44.415°$
		23) 1.035	24) $14.036°$	25) $\frac{3\sqrt{73}}{73}$	26) $\frac{9\sqrt{14}}{28}$
		27) $\frac{1}{5}$	28) $\theta = \tan^{-1}\left(\frac{h}{150}\right)$	29) $d = 410 - 15\tan\theta$	
		30a) $y = -3.4\cos\left(\frac{2\pi}{7}t\right)$		30b) Because the wave started at its lowest point.	

31a) 60	31b) It takes 60 seconds for the Ferris Wheel to complete one circle.	31c) $\frac{1}{60}$	31d) Every second, the Ferris Wheel rotates $\frac{1}{60}$ of a circle.
31e) 118 ft.	31f) 8 ft.	31g) 2.5 circles	31h) 15.369 ft.	31i) 110.631 ft.