College Algebra

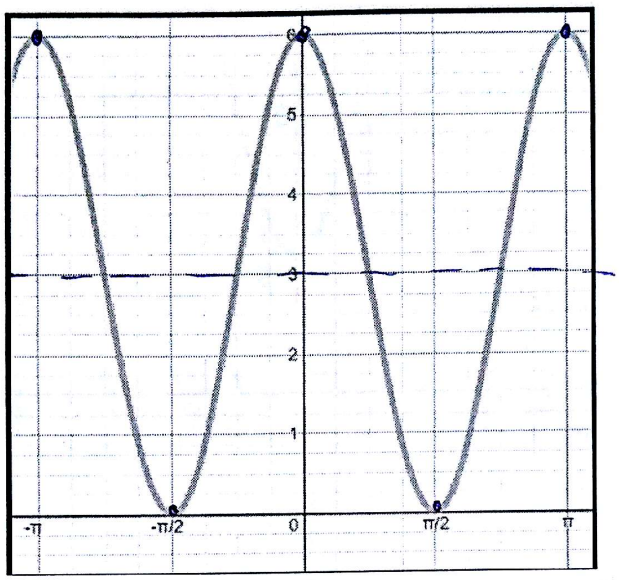
Name: Nonani

Unit 8 Test Review

Date: _____ Period: _____

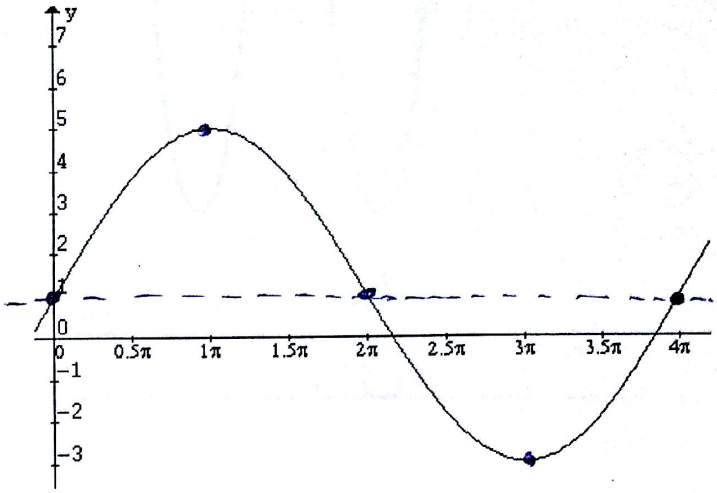
Write the equation for each graph.

1.)



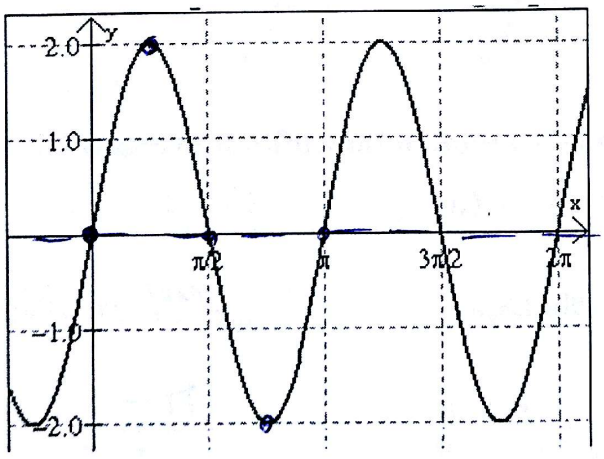
Equation: $y = 3\cos 2(x) + 3$

2.)



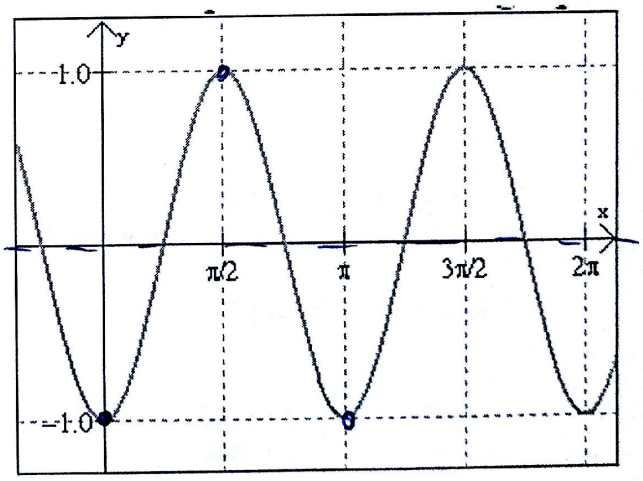
Equation: $y = 4\sin \frac{1}{2}(x) + 1$

3.)



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

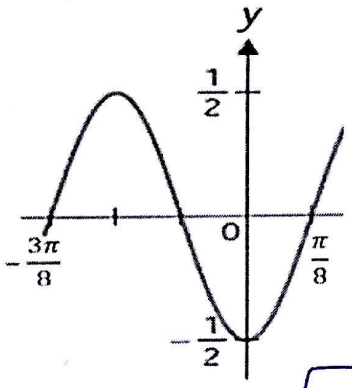
4.)



Equation: $y = -\cos 2(x)$

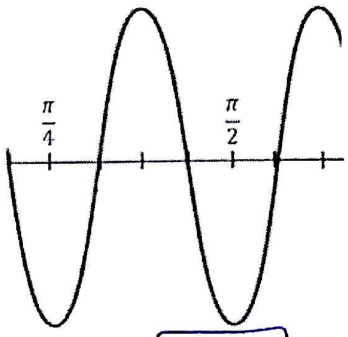
For each graph in problems 5 - 7, what is the least value for the period? Show how you arrived at your answer.

5.)



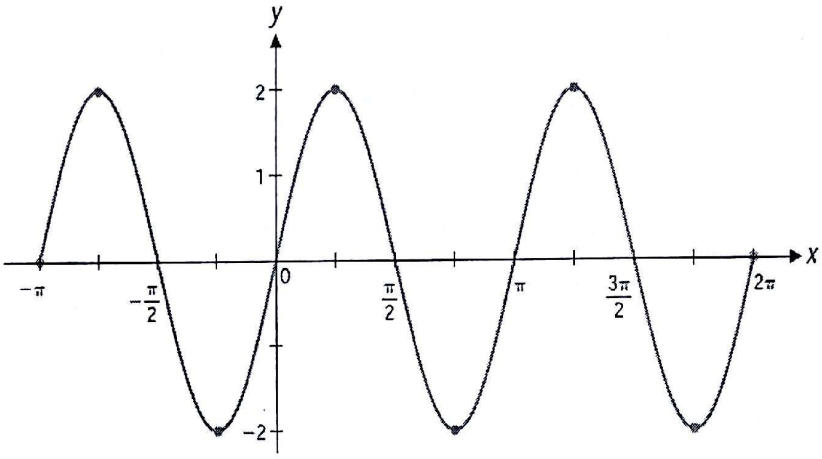
$\frac{\pi}{8} - \left(-\frac{3\pi}{8}\right) = \frac{4\pi}{8} =$ $\boxed{\pi/2}$

6.)



$\frac{\pi}{2} - \frac{\pi}{4} =$ $\boxed{\pi/4}$

7.)



$0 - (-\pi) =$ $\boxed{\pi}$

List the important information for each equation.

8.) $y = 3\tan\frac{1}{3}x - 2$

Amplitude: DNE

Period: 3π

$\pi \div \frac{1}{3} = \pi \cdot 3$

H.S: DNE

V.S: down 2

Asymp.: $-3\pi/2$, $3\pi/2$

$-\frac{\pi}{2} \cdot 3 = -\frac{3\pi}{2}$

$\frac{\pi}{2} \cdot 3 = \frac{3\pi}{2}$

Domain: $(-3\pi/2, 3\pi/2)$

Range: $(-\infty, \infty)$

9.) $y = -\cot(2x + \pi) + 3$

Amplitude: DNE

Period: $\pi/2$

$\pi \div 2 = \pi \cdot \frac{1}{2}$

H.S: left $\pi/2$

V.S: up 3

Asymp.: $-\pi/2$, 0

$0 \cdot \frac{1}{2} = 0 - \pi/2$

$\pi \cdot \frac{1}{2} = \pi/2 - \pi/2$

Domain: $(-\pi/2, 0)$

Range: $(-\infty, \infty)$

10.) $y = -\tan\left(2x - \frac{\pi}{2}\right)$

$y = -\tan 2(x - \pi/4)$

Amplitude: DNE

Period: $\pi/2$

H.S: right $\pi/4$

V.S: DNE

Asymp.: $-\pi/2$, 0

$-\frac{\pi}{2} \cdot \frac{1}{2} = -\frac{\pi}{4} - \frac{\pi}{4}$

$\frac{\pi}{2} \cdot \frac{1}{2} = \frac{\pi}{4} - \frac{\pi}{4}$

Domain: $(-\pi/2, 0)$

Range: $(-\infty, \infty)$

Identify the amplitude, period, and any shifts for each equation. Then graph. Be sure to clearly indicate the location of the asymptotes, if any.

0 + π/3

π/6 + π/3

π/3 + π/3

π/2 + π/3

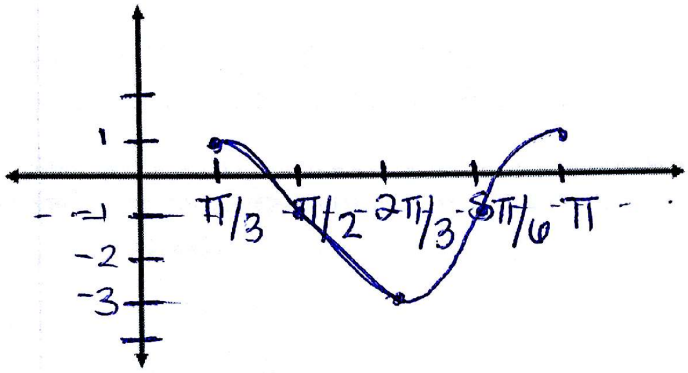
2π/3 + π/3

11.) $y = 2\cos 3\left(x - \frac{\pi}{3}\right) - 1$

Amplitude: 2 Period: 2π/3

H.S: right π/3 V.S.: down 1

Domain: $(-\infty, \infty)$ Range: $[-3, 1]$



$y = 3\sin 4(x + \pi/4)$

12.) $y = 3\sin(4x + \pi)$

Amplitude: 3 Period: π/2

H.S: left π/4 V.S.: ∅

Domain: $(-\infty, \infty)$ Range: $[-3, 3]$

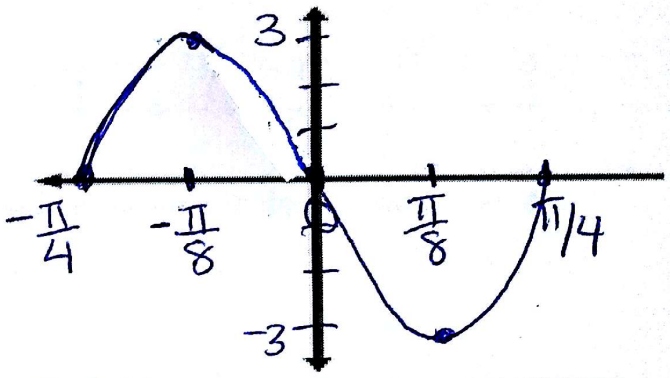
0 - π/4

π/8 - π/4

π/4 - π/4

3π/8 - π/4

π/2 - π/4



0 + π/2

π/4 + π/2

π/2 + π/2

3π/4 + π/2

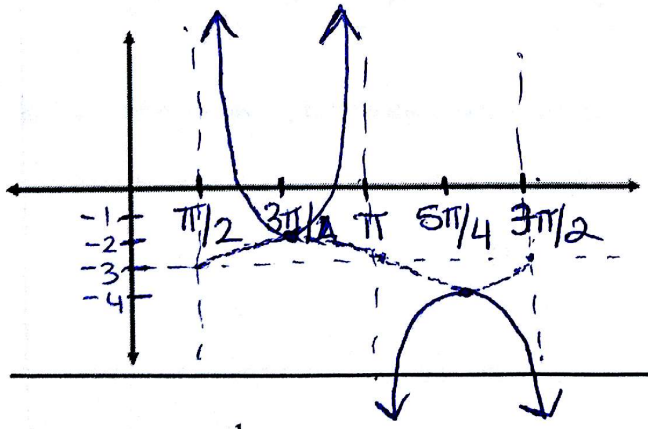
π + π/2

13.) $y = \csc(2x - \pi) - 3$

$y = \csc 2(x - \pi/2) - 3$

Amplitude: DNE Period: π

H.S: right π/2 V.S.: down 3



14.) $y = -\sec 2\left(x + \frac{\pi}{4}\right) + 1$

Amplitude: DNE Period: π

H.S: left π/4 V.S.: up 1

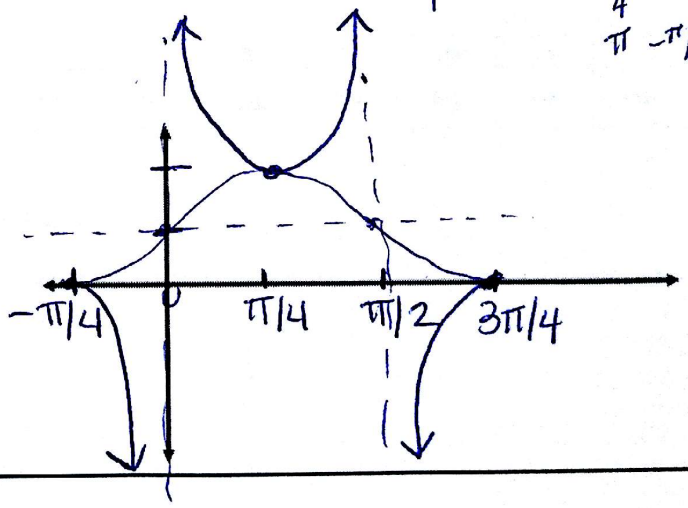
0 - π/4

π/4 - π/4

π/2 - π/4

3π/4 - π/4

π - π/4



15.) $y = -\cot\frac{1}{2}x - 2$

Amplitude: DNE Period: 2π

H.S: DNE V.S.: down 2

16.) $y = -\tan\left(2x - \frac{\pi}{2}\right)$

$y = -\tan 2(x - \pi/4)$

Amplitude: DNE Period: π/2

H.S: right π/4 V.S.: DNE

B A

17.) Write the equation of a cosine function that has a third of the period, an amplitude of 3, and a vertical shift of 5 units down.

D

$y =$ 3 cos 3(x) − 5

18.) Name 5 x-values that contain the vertical asymptotes for the following graphs.

$\frac{\pi}{2} \cdot \frac{1}{4} = \frac{-\pi}{8} + \frac{\pi}{8}$

a.) $y = -3\tan\left(4x - \frac{\pi}{2}\right) + 1$

$\frac{\pi}{2} \cdot \frac{1}{4} = \frac{\pi}{8} + \frac{\pi}{8}$ $y = -3 \tan 4(x - \pi/8) + 1$

$-\pi/2, -\pi/4, 0, \pi/4, \pi/2$

b.) $y = \cot(2x + \pi) - 3$

$y = \cot 2(x + \pi/2) - 3$

$0 - \frac{\pi}{2}$ $\frac{\pi}{2} - \frac{\pi}{2}$

$-\pi, -\pi/2, 0, \pi/2, \pi$

19.) In comparison to $y = \cos x$, which of the following has half the amplitude and three times the period?

a.) $y = \frac{1}{2}\cos 3x$

b.) $y = 2\cos\frac{1}{3}x$

c.) $y = 2\cos 3x$

d.) $y = \frac{1}{2}\cos\frac{1}{3}x$

20.) The monthly average electric bill for a family of 2 is shown in the table below.

Month	1	2	3	4	5	6	7	8	9	10	11	12
Temperature (°F)	61	65	70	75	79	80	79	75	70	65	61	60

Which of the following functions models the data most closely?

a.) $f(x) = 10\sin\frac{\pi}{6}(x - 3) + 51$

b.) $f(x) = 61\sin\frac{\pi}{6}(x - 1) + 20$

c.) $f(x) = 10\sin\frac{\pi}{6}(x - 3) + 70$

d.) $f(x) = 80\sin\frac{\pi}{6}(x - 3) + 61$