FST Trig Chapter 3 review

In Problems 1-4, match each equation with one of the following graphing utility displays.

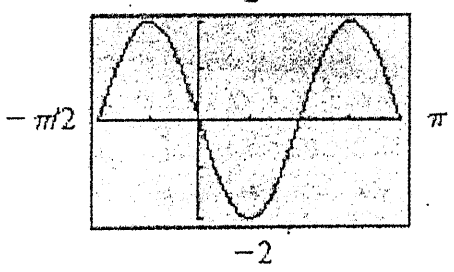
1. $y = 2\sin\left(\pi x - \frac{\pi}{2}\right)$ Period: $\frac{2\pi}{\pi} = 2$ P.S. $\frac{1}{2}$ Graph: B

2. $y = 2\cos\left(\pi x + \frac{\pi}{2}\right)$ Period: $\frac{2\pi}{\pi} = 2$ P.S. $-\frac{1}{2}$ Graph: C

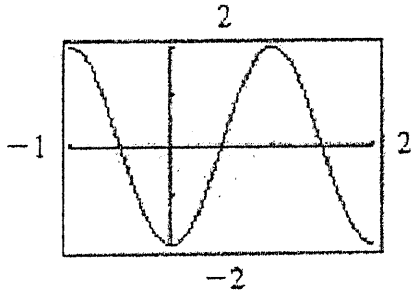
3. $y = 2\cos\left(2x + \frac{\pi}{2}\right)$ Period: $\frac{2\pi}{2} = \pi$ P.S. $\frac{-\pi}{4}$ Graph: A

4. $y = 2\sin\left(2x - \frac{\pi}{2}\right)$ Period: $\frac{2\pi}{2} = \pi$ P.S. $\frac{\pi}{4}$ Graph: D

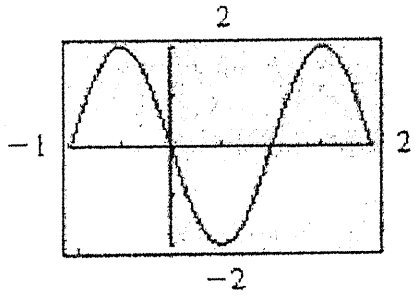
(A)



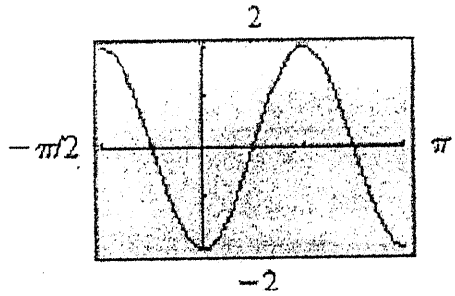
(B)



(C)



(D)



① P.S. $= \frac{\frac{\pi}{2} \cdot \frac{1}{\pi}}{\frac{\pi}{1}} = \frac{1}{2}$

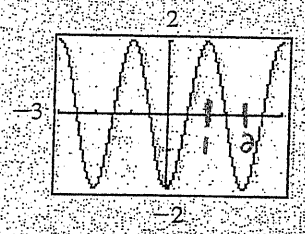
② P.S. $= \frac{-\frac{\pi}{2} \cdot \frac{1}{\pi}}{\frac{\pi}{1}} = -\frac{1}{2}$

③ P.S. $= \frac{-\frac{\pi}{2} \cdot \frac{1}{2}}{\frac{2}{1}} = -\frac{\pi}{4}$

④ P.S. $= \frac{\frac{\pi}{2} \cdot \frac{1}{2}}{\frac{2}{1}} = \frac{\pi}{4}$

EXPLORE/DISCUSS 1

Find an equation of the form $y = A\cos(Bx + C)$ that produces the graph in the following graphing calculator display (choose the smallest positive phase shift):



Is it possible for an equation of the form $y = A\sin(Bx + C)$ to produce the same graph? Explain. If it is possible, find the equation using the smallest positive phase shift. → Yes

Amp = 2

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

$P = \frac{2\pi}{B}(2) = \left(\frac{2\pi}{B}\right)B$

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

$B = \pi$

$P.S. = \frac{-C}{B}$

$\pi(1) = \left(\frac{-C}{\pi}\right)\pi$

$\pi = -C$

$C = -\pi$

Amp = 2

$P = \frac{2\pi}{B}(2) = (2)B$

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

$B = \pi$

$P.S. = \frac{-C}{B}$

$\pi\left(\frac{1}{2}\right) = \left(\frac{-C}{\pi}\right)\pi$

$\frac{\pi}{2} = -C$

$C = -\frac{\pi}{2}$

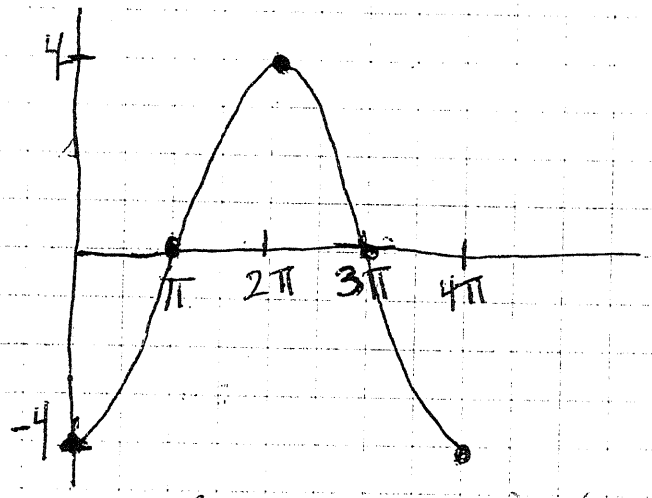
$y = 2\sin\left(\pi x - \frac{\pi}{2}\right)$

EXPLORE/DISCUSS 2

Explain why any function of the form $y = A\sin(Bx + C)$ can also be written in the form $y = A\cos(Bx + D)$ for an appropriate choice of D.

★ Same Amp + Period, just different phase Shift

(1)



The graph pictured has an equation of the form $y = A\cos(Bx)$ find A and B

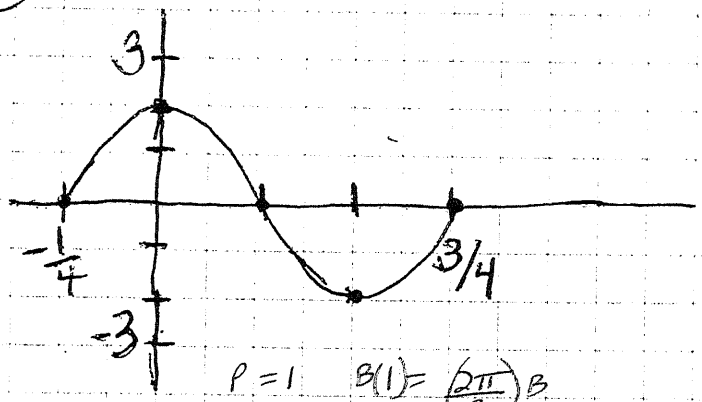
A: -4 B: $\frac{1}{2}$

$P = 4\pi$ $\quad B(4\pi) = \left(\frac{2\pi}{B}\right)B$

★ Flip ★

$\frac{4\pi B}{4\pi} = \frac{2\pi}{4\pi}$ $\quad B = \frac{1}{2}$

(2)



The graph pictured has an equation of the form $y = A\sin(Bx+C)$ Find A, B & C

$P = 1$ $\quad B(1) = \left(\frac{2\pi}{B}\right)B$

$B = 2\pi$

A: 2 B: 2π C: $\pi/2$

P.S. $= -\frac{1}{4}$ $\quad 2\pi\left(-\frac{1}{4}\right) = \left(\frac{-C}{2\pi}\right)2\pi$ $\quad -C = -\frac{2\pi}{4}$

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

(3) An alternating current generator produces a current with amplitude of 15 amperes and a frequency of 18 Hz. If its equation is given by $I = A\sin(Bt)$, find A and B

A: 15 $\quad P = \frac{1}{f} = \frac{1}{18}$

B: 36π $\quad B\left(\frac{1}{18}\right) = \left(\frac{2\pi}{B}\right)B$

$I = 15\sin(36\pi t)$ $\quad 18\left(\frac{B}{18}\right) = (2\pi)18$

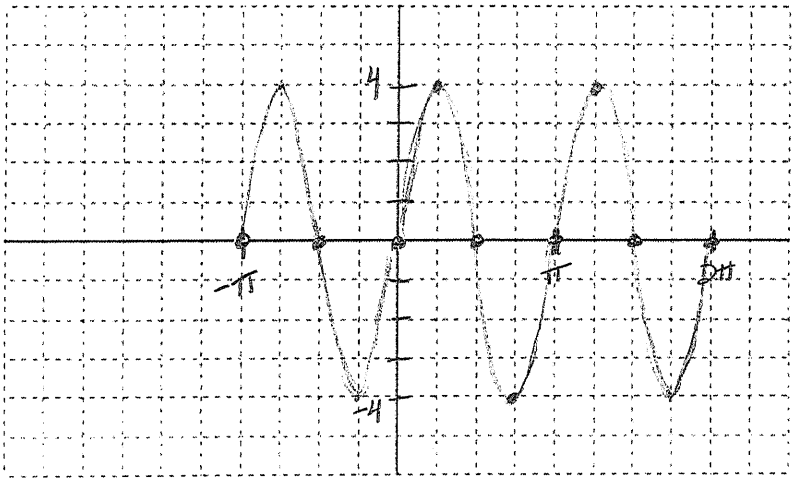
$B = 36\pi$

Graph the trig function.

$y = 4\sin(2x)$ $\quad -\pi \le x \le 2\pi$

$Amp = 4$

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



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

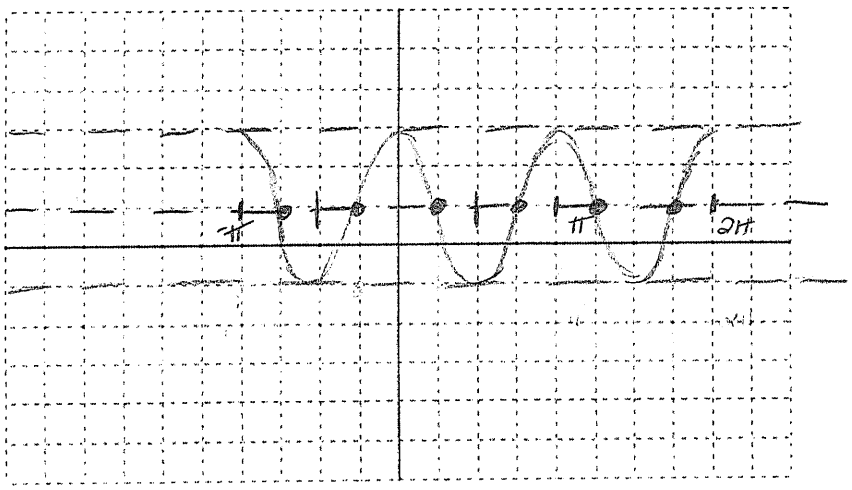
↑1 ★FLIP★

$Amp = 2$

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

$P.S. = \frac{-C}{B} = \frac{-\pi}{2}$

$-\frac{\pi}{2} + \pi = \frac{\pi}{2}$

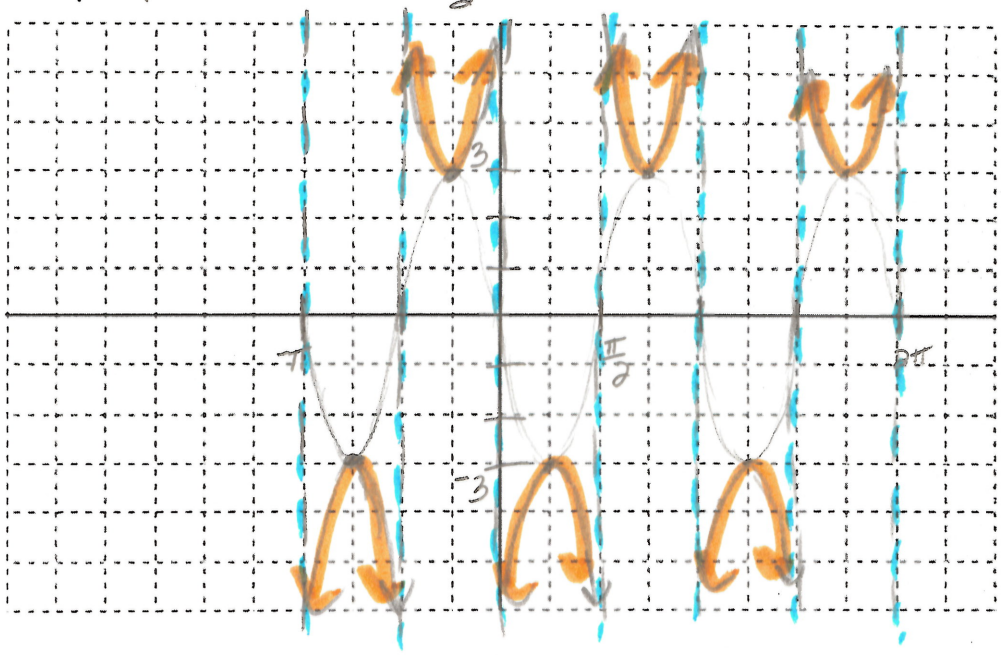


FST Trig 3.6 Warm-up **Name** _____

Graph the following Trig functions.

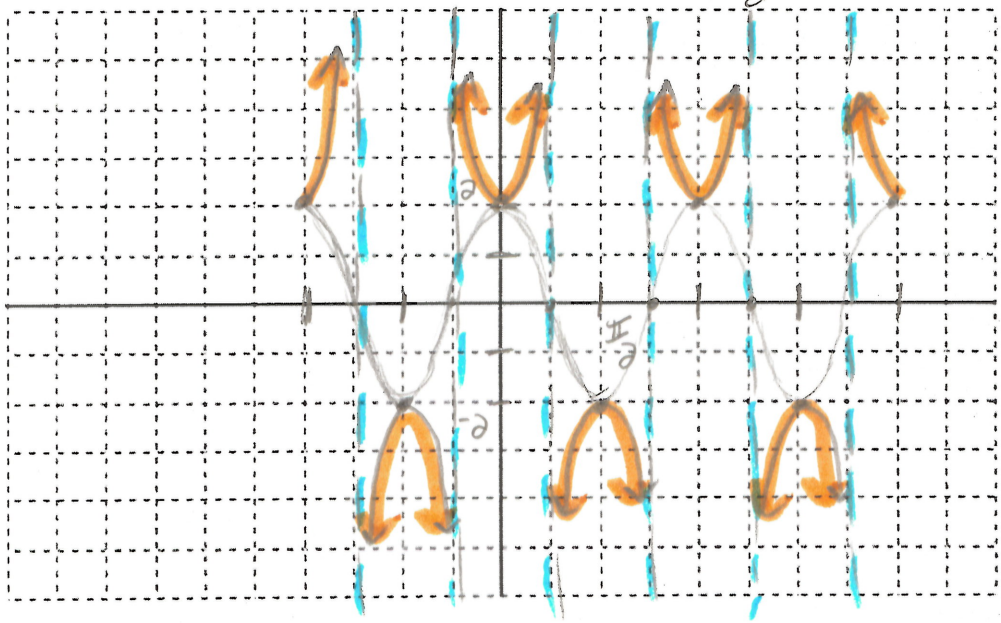
1) $y = 3\csc(2x - \pi)$ $-\pi \le x \le 2\pi$

Amp = 3 $P = \frac{2\pi}{2} = \pi$ $P.S. = \frac{-C}{B} = \frac{\pi}{2}$



2) $y = -2\sec(2x - \pi)$ $-\pi \le x \le 2\pi$

Amp = 2 * FLIP $P = \frac{2\pi}{2} = \pi$ $P.S. = \frac{-C}{B} = \frac{\pi}{2}$



FST Trig 3.6 Warm-up **Name** _____

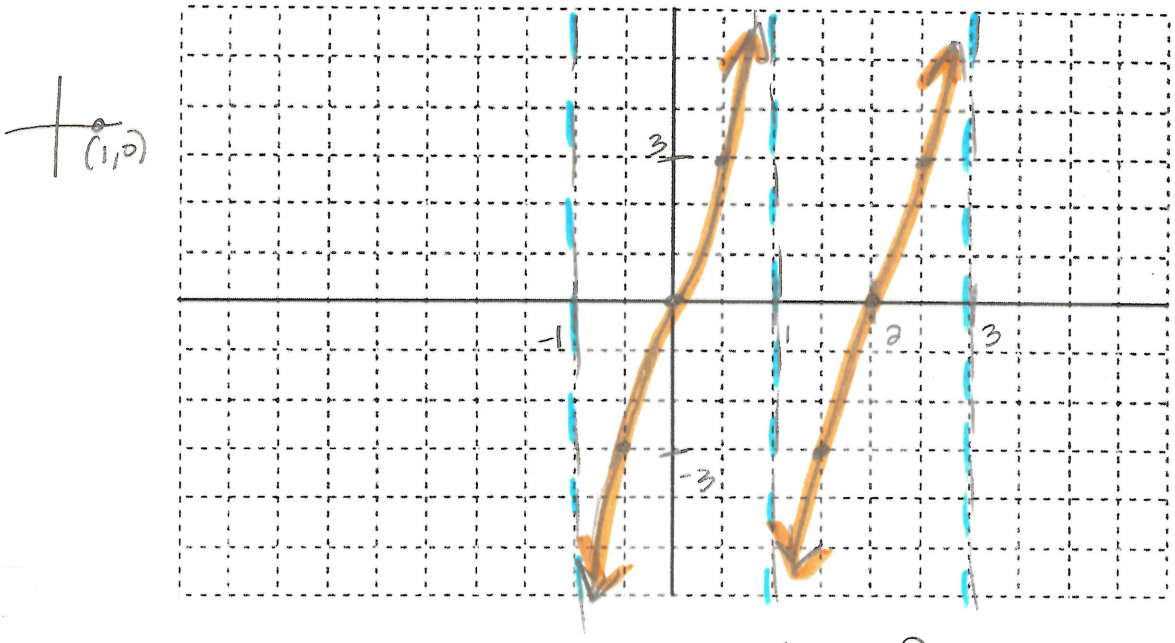
Graph the following Trig functions.

1) $y = 3\tan(\frac{\pi}{2}x - \pi)$ $-1 \le x \le 3$

Amp = 3

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

$P.S. = \frac{\pi}{\frac{\pi}{2}} = 2$



2) $y = 2\cot(2x - \pi)$ $0 \le x \le \pi$

Amp = 2

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

$P.S. = \frac{\pi}{2}$