Math 1113 Name: _____

2.5 ICA part 2 – Graphing Sine and Cosine functions

Graph the trigonometric functions

1. $y = \sin\left(x - \frac{3\pi}{4}\right)$

a. Amplitude, $A =$ 1

b. B= 1

c. C= $3\pi/4$

d. Vertical shift, D= 0

e. Period = 2π

f. Xscale = $\pi/2$

g. Phase shift = $3\pi/4$

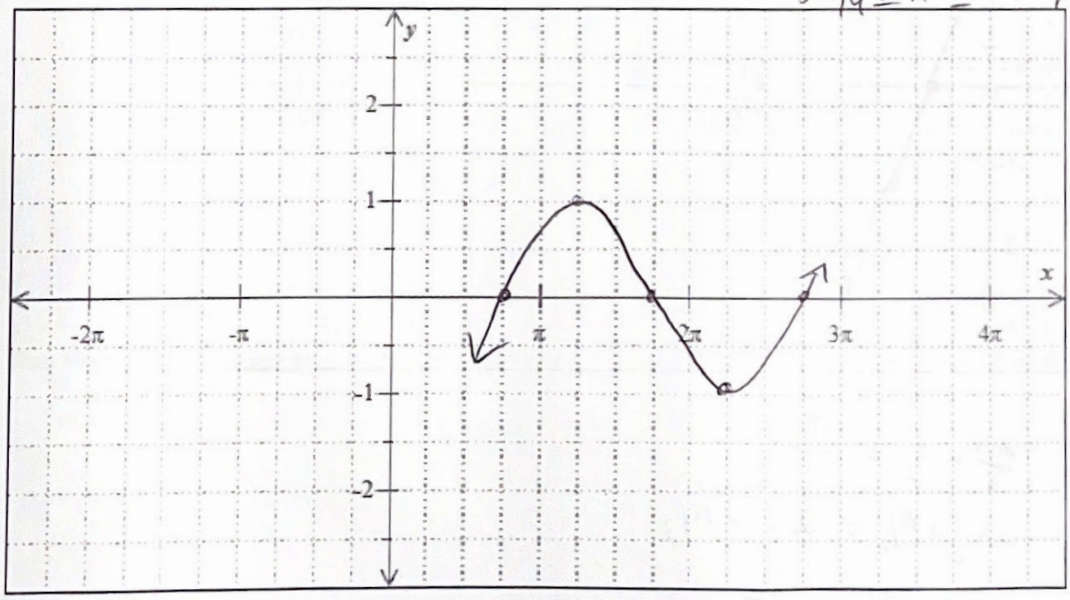
x	y
$3\pi/4$	0
$5\pi/4$	1
$7\pi/4$	0
$9\pi/4$	-1
$11\pi/4$	0

h. Graph one period of the function starting from the phase shift:

$0 \leq x - 3\pi/4 \leq 2\pi$

$3\pi/4 \quad +3\pi/4 \quad +3\pi/4$

$3\pi/4 \leq x \leq 11\pi/4$



2. $y = \frac{5}{2}\sin\left(x + \frac{2\pi}{3}\right)$

a. Amplitude, $A =$ $5/2$

b. B= 1

c. C= $-2\pi/3$

d. Vertical shift, D= 0

e. Period = 2π

f. Xscale = $\pi/2$

g. Phase shift = $-2\pi/3$

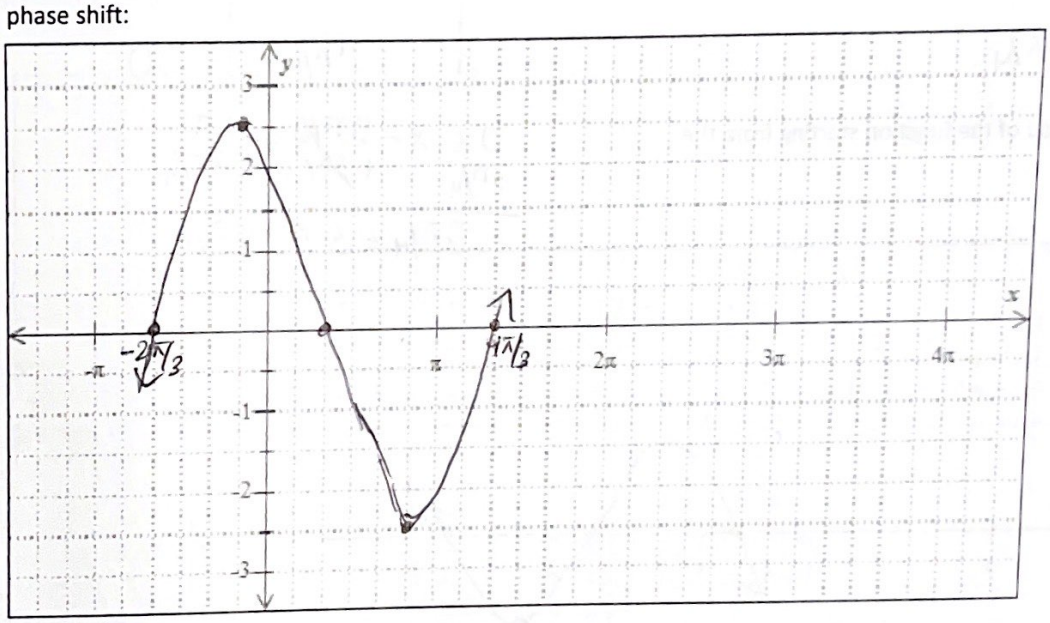
$0 \le x + 2\pi/3 \le 2\pi$

$-2\pi/3 \quad -2\pi/3 \quad -2\pi/3$

$-2\pi/3 \le x \le 4\pi/3$

x	y
$-2\pi/3$	0
$-\pi/6$	$5/2$
$\pi/3$	0
$5\pi/6$	$-5/2$
$4\pi/3$	0

h. Graph one period of the function starting from the phase shift:



$-\frac{2\pi}{3} + \frac{\pi}{2} = \frac{-\pi}{6}$

$-\pi/6 + \pi/2 = 2\pi/6 = \pi/3$

$\pi/3 + \pi/2 = \frac{5\pi}{6}$

$5\pi/6 + \pi/2 = 8\pi/6 = 4\pi/3$

3. $y = -\cos(x + \pi) - 1$

a. Amplitude, $A =$ 1

b. B= 1

c. C= $-\pi$

d. Vertical shift, D= -1

e. Period = 2π

f. Xscale = $\pi/2$

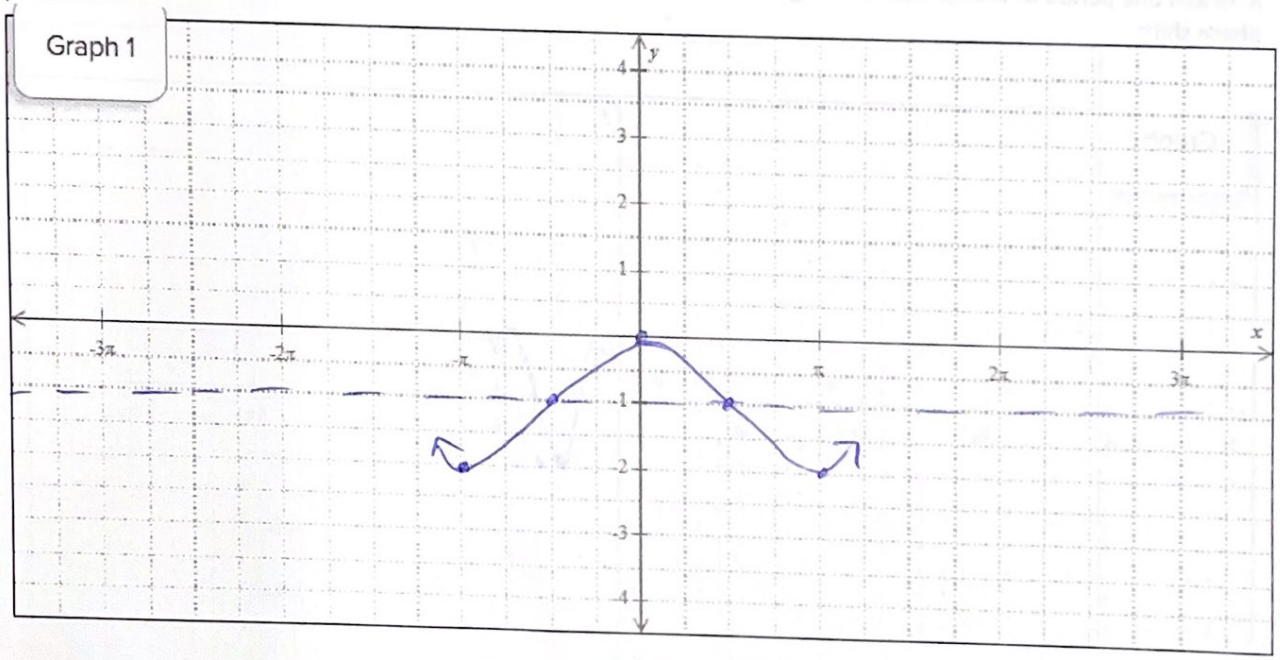
g. Phase shift = $-\pi$

$0 \leq x + \pi \leq 2\pi$

$-\pi \leq x \leq \pi$

x	y
$-\pi$	-2
$-\pi/2$	-1
0	0
$\pi/2$	-1
π	-2

h. Graph one period of the function starting from the phase shift:



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

a. Amplitude, $A =$ 1

b. B= 3

c. C= $\pi/2$

d. Vertical shift, D= 0

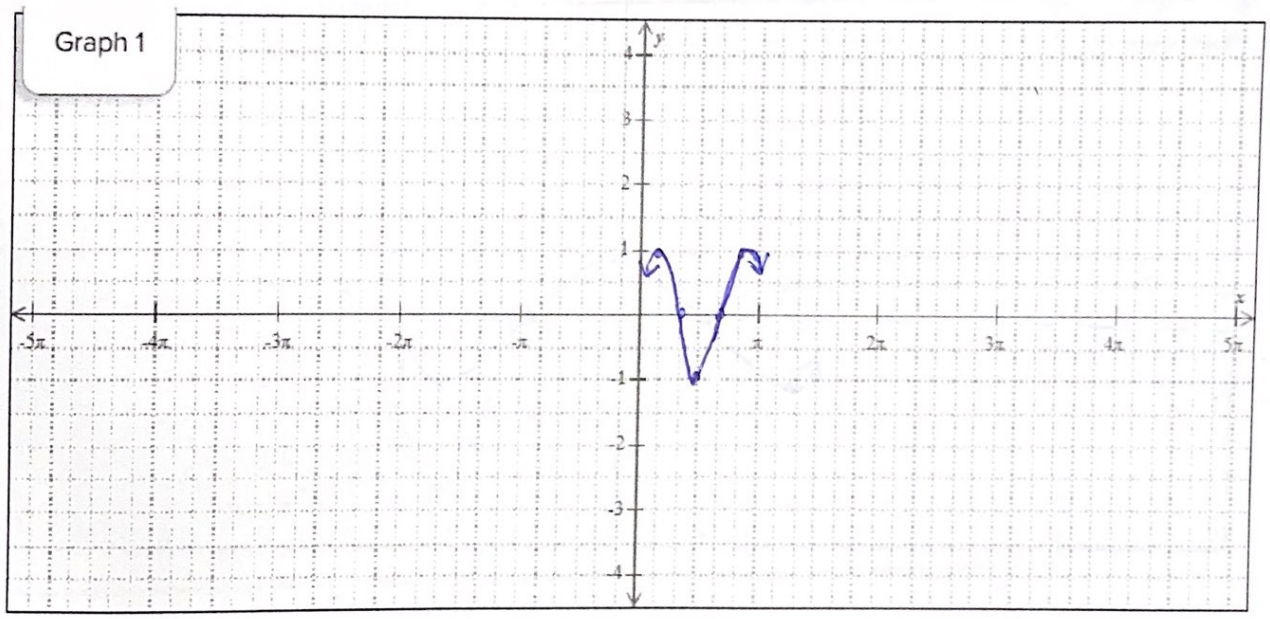
e. Period = $2\pi/3$

f. Xscale = $\frac{2\pi/3}{4} = \pi/6$

g. Phase shift = $\pi/6$

x	y
$\pi/6$	1
$2\pi/6 = \pi/3$	0
$3\pi/6 = \pi/2$	-1
$4\pi/6 = 2\pi/3$	0
$5\pi/6$	1

h. Graph one period of the function starting from the phase shift:



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

a. Amplitude, $A =$ 2

b. B= 2

c. C= 0

d. Vertical shift, D= 1

e. Period = $2\pi/2 = \pi$

f. Xscale = $\pi/4$

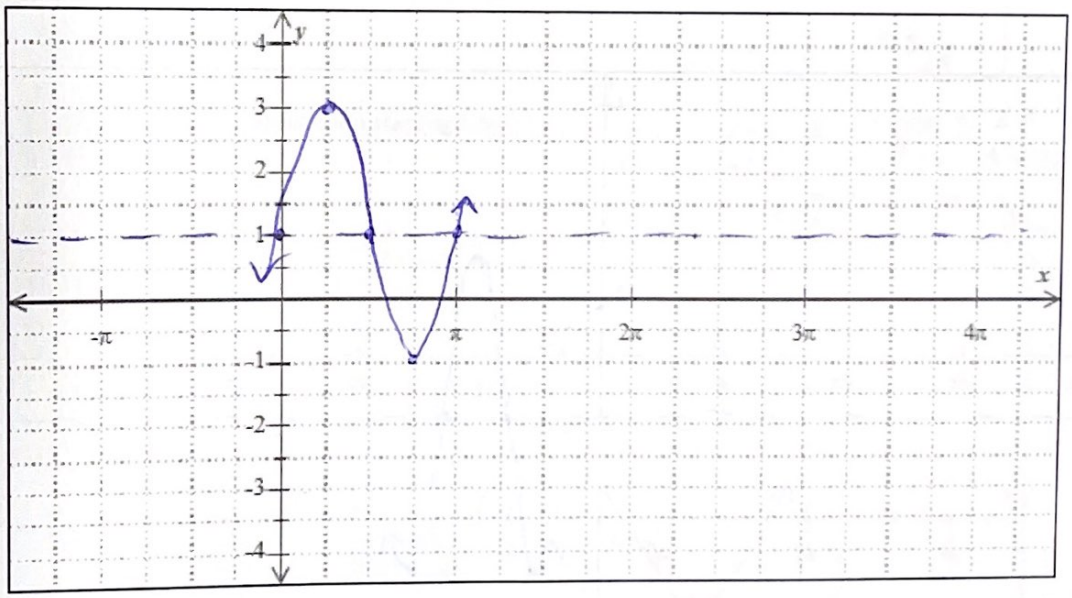
$0 \le 2x \le 2\pi$

$0 \le x \le \pi$

g. Phase shift = 0

x	y
0	1
$\pi/4$	3
$\pi/2$	1
$3\pi/4$	-1
π	0

h. Graph one period of the function starting from the phase shift:



6. $y = -\frac{5}{2}\cos(2x - \pi) - 1$

a. Amplitude, $A =$ $5/2$

b. B= 2

c. C= π

d. Vertical shift, D= -1

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

f. Xscale = $\pi/4$

g. Phase shift = $\pi/2$

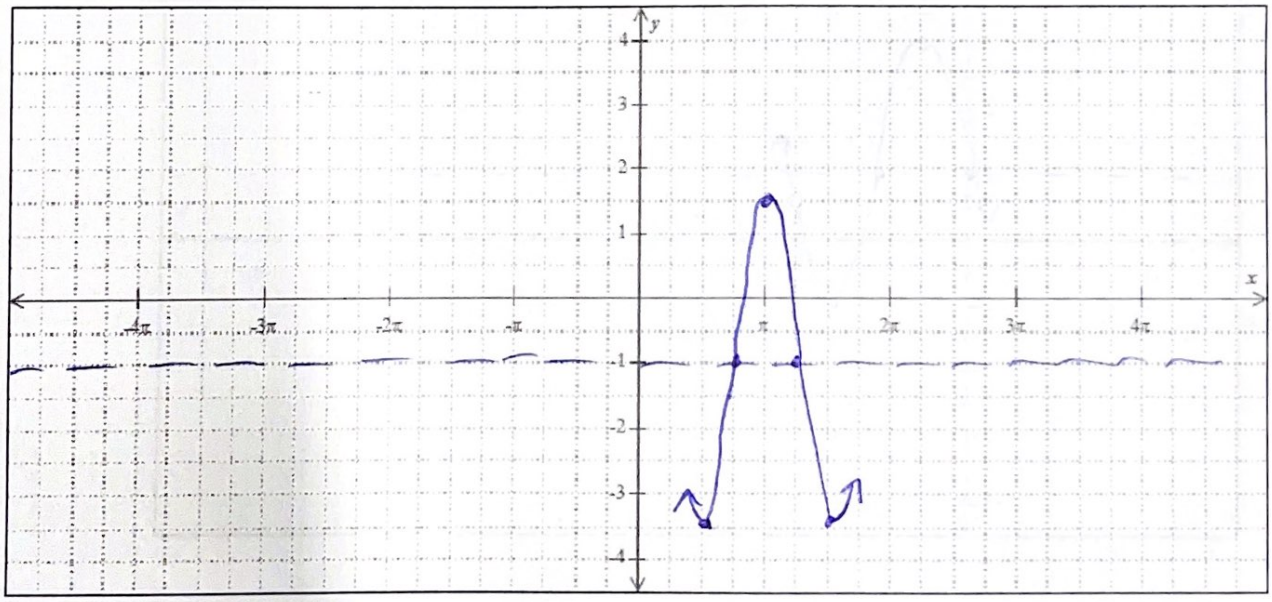
$0 \le 2x - \pi \le 2\pi$

$\pi \le 2x \le 3\pi$

$\pi/2 \le x \le 3\pi/2$

x	y
$\pi/2$	-3.5
$3\pi/4$	-1
π	1.5
$5\pi/4$	-1
$3\pi/2$	-3.5

h. Graph one period of the function starting from the phase shift:



$\pi/2 + \pi/4 = 3\pi/4$

$3\pi/4 + \pi/4 = \pi$

$\pi + \pi/4 = 5\pi/4$

$5\pi/4 + \pi/4 = 6\pi/4 = 3\pi/2$