



Day 1

Name: Completed Notes

PreCalc
S1

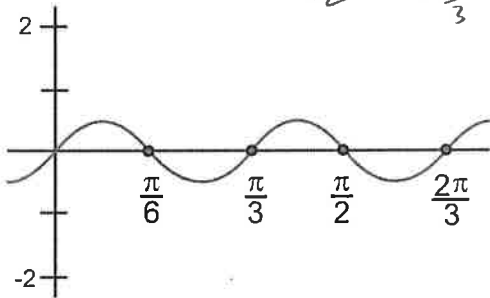
Objective(s):

- Sketch graphs of Sine and Cosine functions by hand with vertical and horizontal shifts

Warm-up:

1. Identify the amplitude, period, domain and range of the trigonometric function below.

(Challenge: Write a possible equation.)



$y = \frac{1}{2} \sin(6x)$

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

$b \cdot \frac{\pi}{3} = 2\pi \cdot \frac{3}{\pi}$
 $b = 6$

53. Which of the following trigonometric functions is equivalent to the function $g(x) = \sin x \sec x$?

(Note: $\sec x = \frac{1}{\cos x}$)

- A. $f(x) = \cos x$
- B. $f(x) = \cot x$
- C. $f(x) = \csc x$
- D. $f(x) = \sin x$
- E. $f(x) = \tan x$

Ex 1:

Describe the transformation of the given sine or cosine function to the parent function. $2(x + \frac{\pi}{2})$

A.) $y = \sin(x + 3) - 4$

• Shift left 3, down 4

B.) $y = -4 \sin(2x + \pi) + 2$

- Reflection over x-axis
- Vert. stretch by 4
- Horiz. shrink by 2
- Shift left $\frac{\pi}{2}$, up 2

C.) $y = -\cos(x - 2) + 1$

- Reflection over x-axis
- Shift right 2, up 1

D.) $y = 2 \cos(x) - 2$

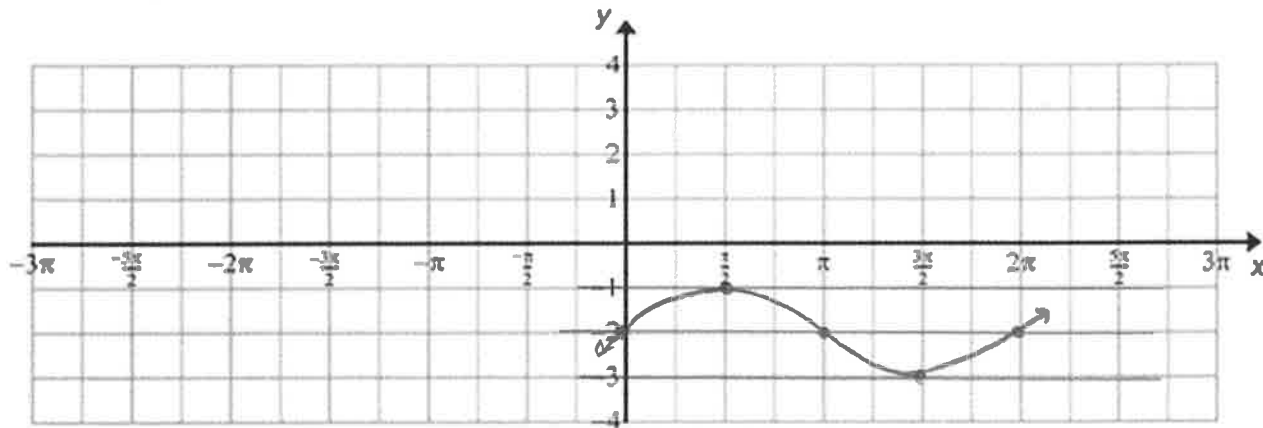
- Vert. stretch by 2
- Shift down 2

Let's do the wave again!

Ex 2: Graph the following functions:

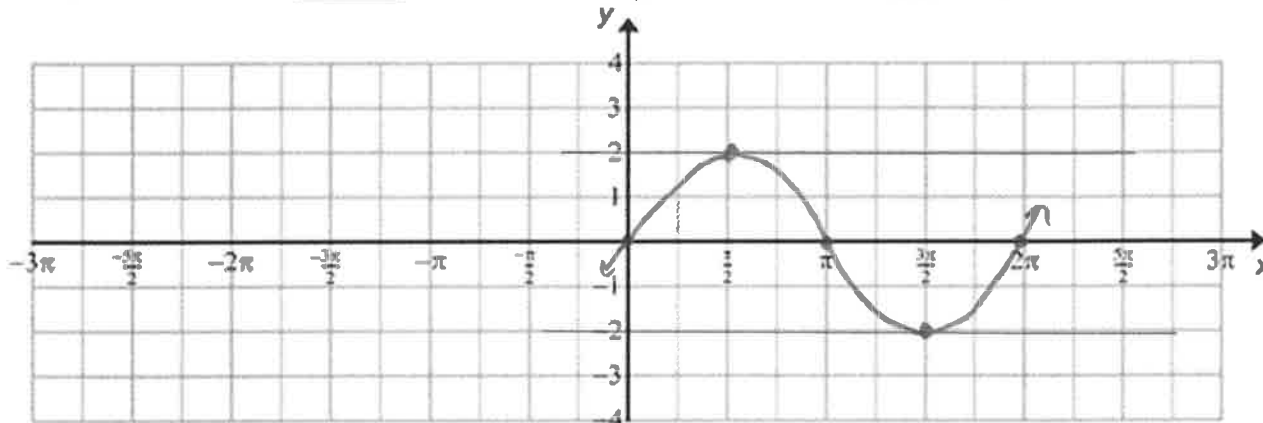
A.) $y = \sin(x) - 2$

Amplitude: 1 Period: 2π Midline: $y = -2$ Domain: $(-\infty, \infty)$ Range: $[-3, -1]$



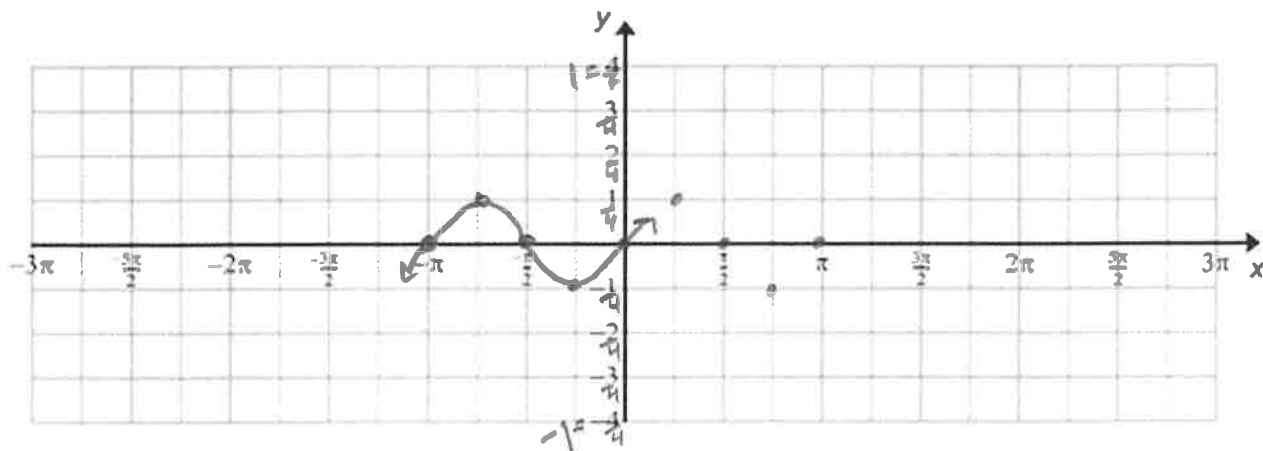
B.) $y = 2\sin(x - \pi)$

Amplitude: 2 Period: 2π Midline: $y = 0$ Domain: $(-\infty, \infty)$ Range: $[-2, 2]$



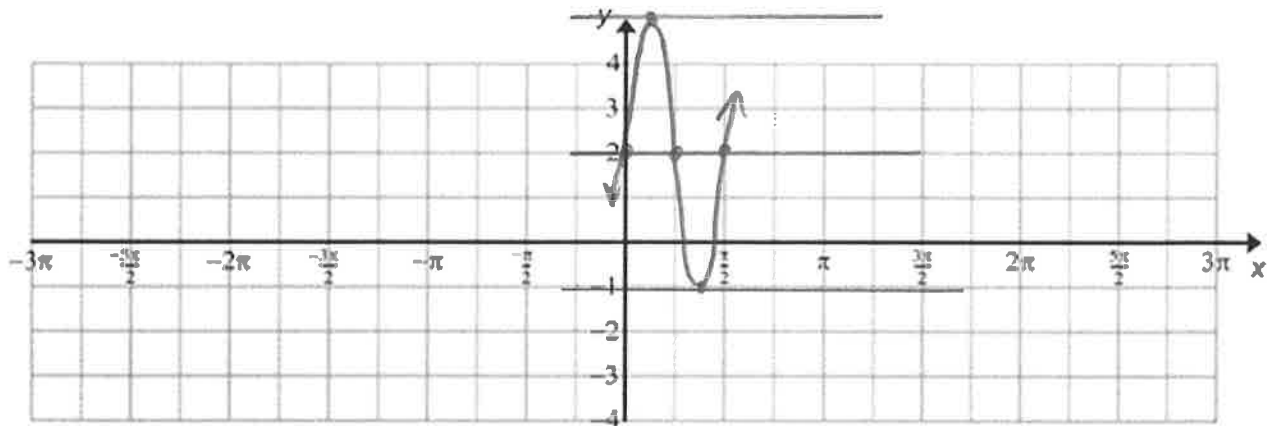
C.) $y = \frac{1}{4}\sin 2(x + \pi)$ ↪ shift left by π

Amplitude: $1/4$ Period: $\frac{2\pi}{2} = \pi$ Midline: $y = 0$ Domain: $(-\infty, \infty)$ Range: $[-1/4, 1/4]$



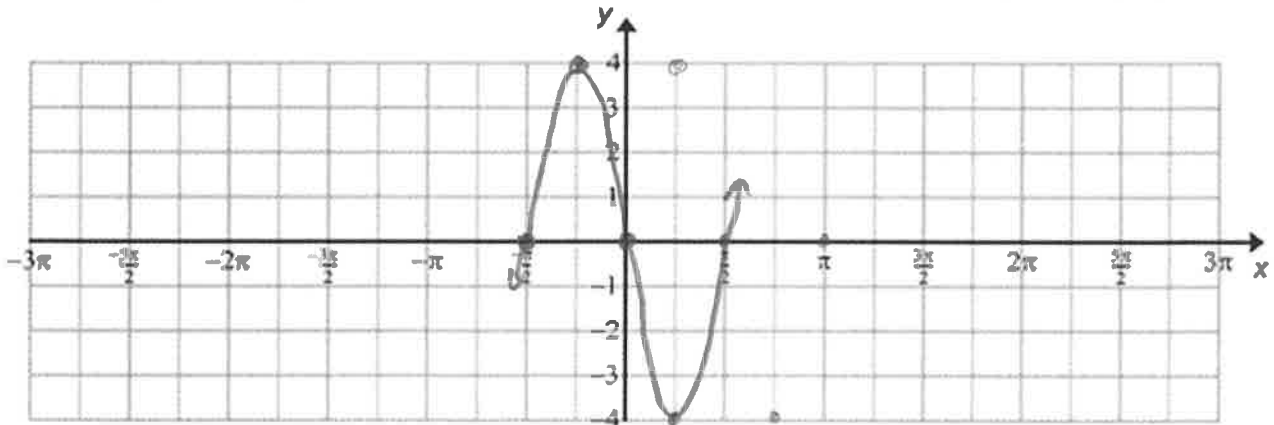
D.) $y = 2 + 3\sin(4x)$ or $3\sin(4x) + 2$

Amplitude: 3 Period: $\frac{2\pi}{4} = \frac{\pi}{2}$ Midline: $y = 2$ Domain: $(-\infty, \infty)$ Range: $[-1, 5]$



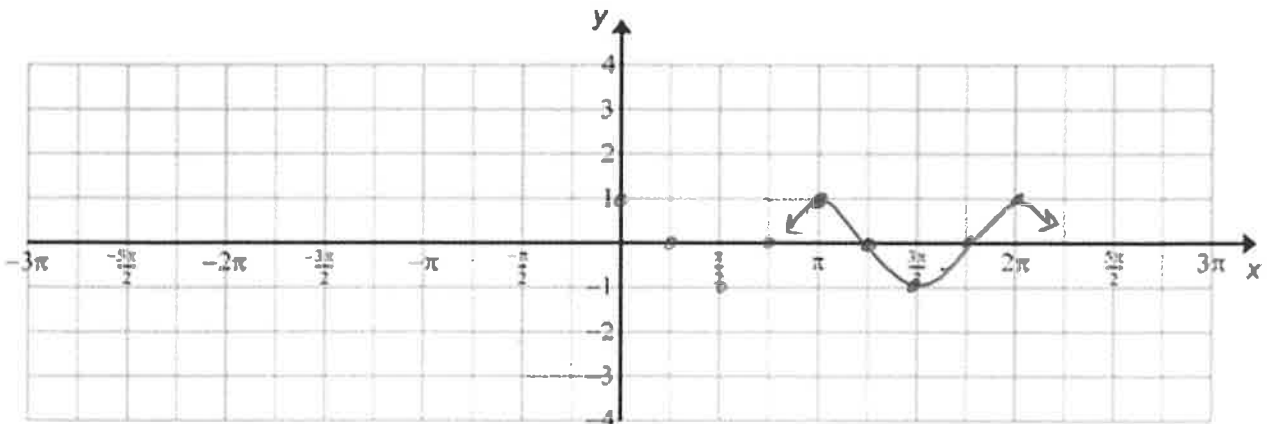
E.) $y = 4\sin(2x + \pi)$ $\rightarrow 2(x + \frac{\pi}{2})$ left by $\frac{\pi}{2}$

Amplitude: 4 Period: $\frac{2\pi}{2} = \pi$ Midline: $y = 0$ Domain: $(-\infty, \infty)$ Range: $[-4, 4]$



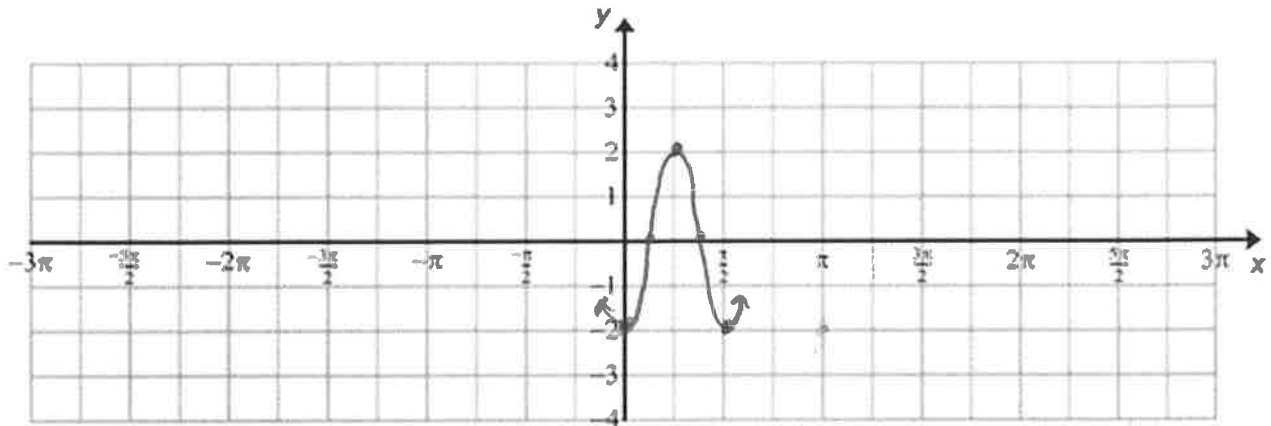
F.) $y = \cos(2(x - \pi))$ right by π

Amplitude: 1 Period: $\frac{2\pi}{2} = \pi$ Midline: $y = 0$ Domain: $(-\infty, \infty)$ Range: $[-1, 1]$



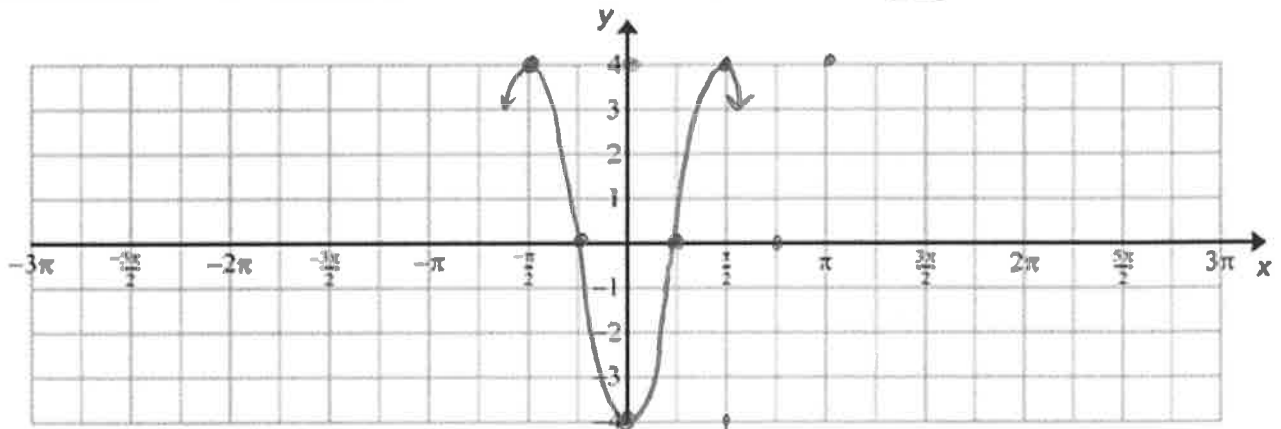
G.) $y = -2 \cos 4x$ ↗ reflection

Amplitude: 2 Period: $\frac{2\pi}{4} = \frac{\pi}{2}$ Midline: $y=0$ Domain: $(-\infty, \infty)$ Range: $[-2, 2]$



H.) $y = 4 \cos 2(x + \frac{\pi}{2})$ ↖ left $\frac{\pi}{2}$

Amplitude: 4 Period: $\frac{2\pi}{2} = \pi$ Midline: $y=0$ Domain: $(-\infty, \infty)$ Range: $[-4, 4]$



I.) $y = -\cos \frac{1}{2}(x - 2\pi)$ ↗ reflection ↘ right by 2π

Amplitude: 1 Period: $\frac{2\pi}{\frac{1}{2}} = 4\pi$ Midline: $y=0$ Domain: $(-\infty, \infty)$ Range: $[-1, 1]$

