



Day 2

Name: Completed Notes

PC
S2

Objective(s):

- I can graph Sine and Cosine Functions by hand by determining its key components including vertical and horizontal shifts.

Warm-up:

1. Determine the amplitude, period, midline and phase shift of the following functions.

A.) $y = \sin(x + \frac{\pi}{4}) - 1$

Amp = 1

Per = 2π

Phase: left $\frac{\pi}{4}$

midline: $y = -1$

B.) $y = \frac{3}{2} \cos(4(x - \frac{\pi}{6}) + \frac{1}{2})$

Amp = $\frac{3}{2}$

Per = $\frac{2\pi}{4} = \frac{\pi}{2}$

Phase: Right $\frac{\pi}{6}$

midline: $y = \frac{1}{2}$

Let's do the wave again (with horizontal and vertical shifts)!

Ex 1: Graph the following functions:

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

Amplitude: 1

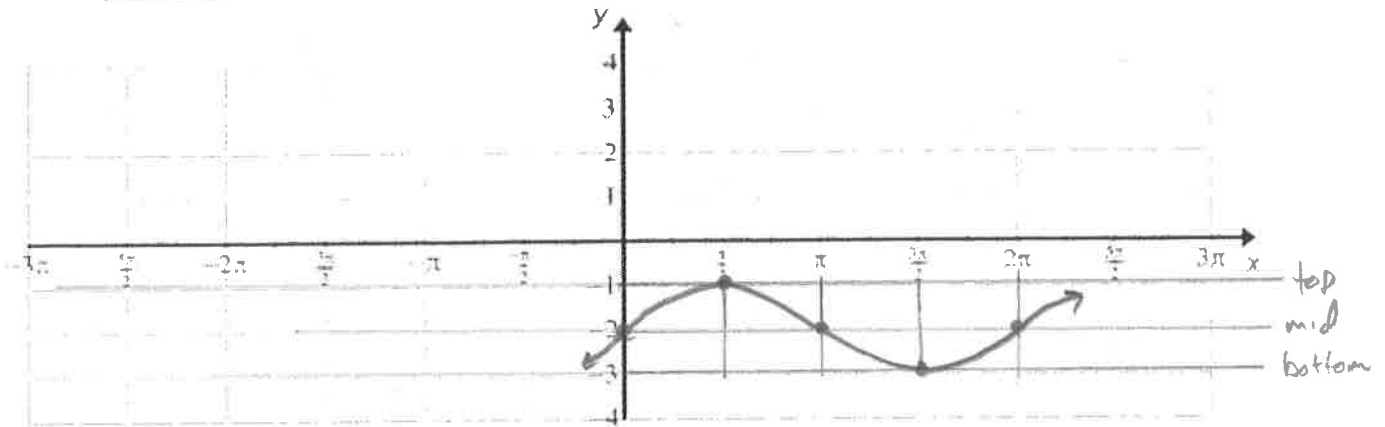
Midline: $y = -2$

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

Period: 2π

Phase shift: none

Range: $[-3, -1]$



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

Amplitude: 2

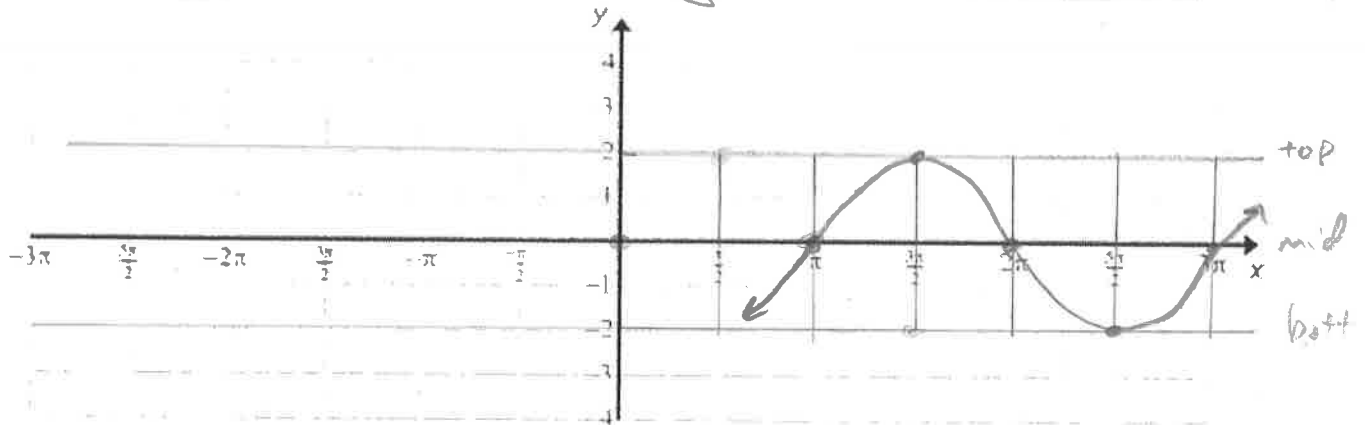
Midline: $y=0$

Domain $(-\infty, \infty)$

Period: 2π

Phase shift: right π

Range: $[-2, 2]$



C.) $y = 3\sin(x + \frac{\pi}{4}) + 1$

Amplitude: 3

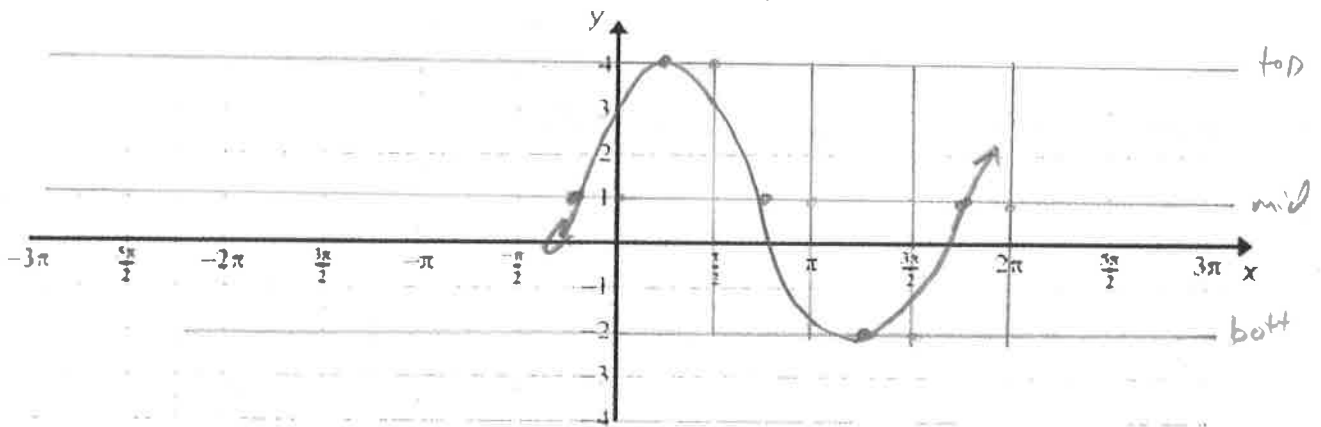
Midline: $y=1$

Domain $(-\infty, \infty)$

Period: 2π

Phase shift: left $\frac{\pi}{4}$

Range: $[-2, 4]$



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

Amplitude: 2

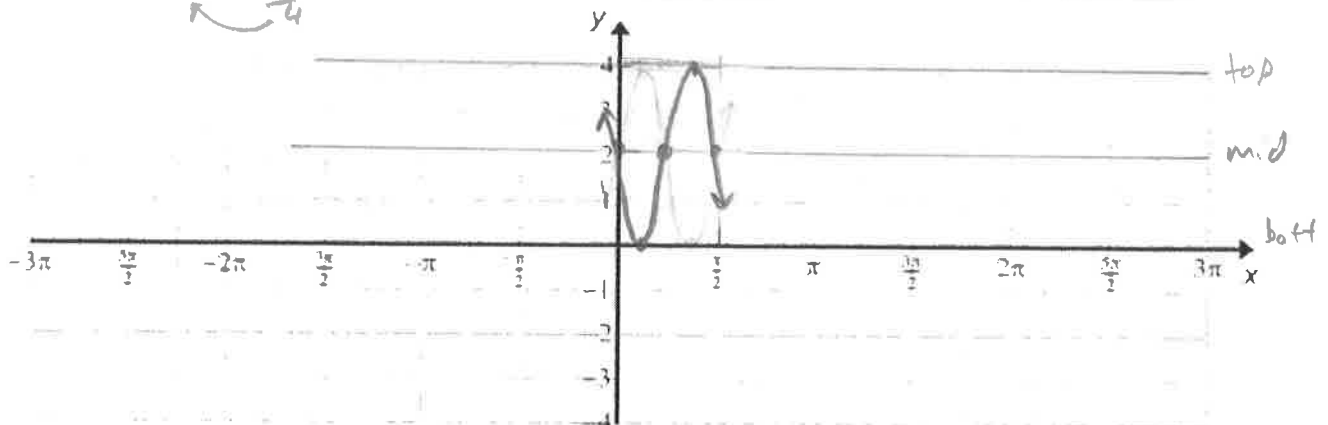
Midline: $y=2$

Domain $(-\infty, \infty)$

Period: $\frac{\pi}{2}$ $\leftarrow \frac{2\pi}{4}$

Phase shift: none

Range: $[0, 4]$



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

Amplitude: 4

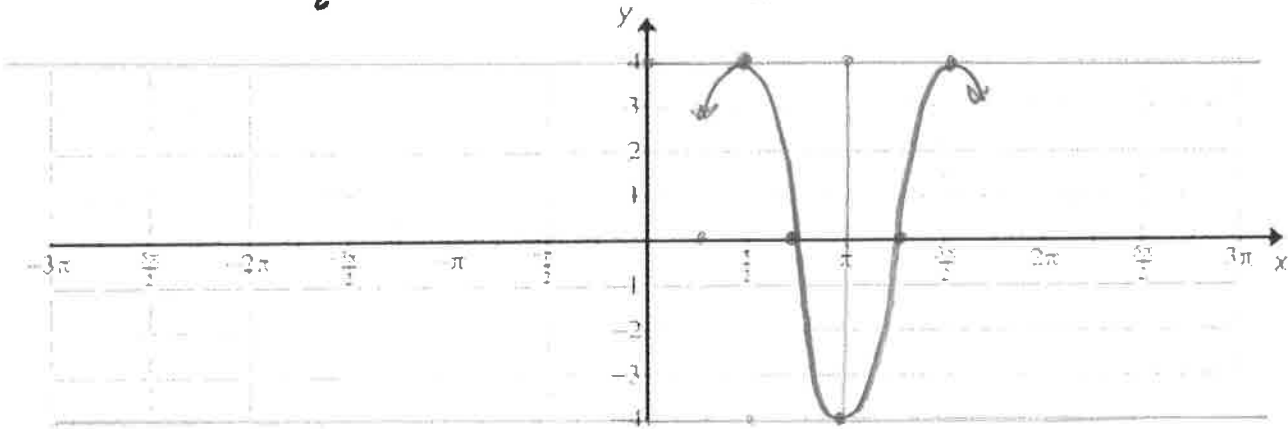
Midline: $y=0$

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

Period: π $\frac{2\pi}{2}$

Phase shift: right $\frac{\pi}{2}$

Range: $[-4, 4]$



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

Amplitude: 1

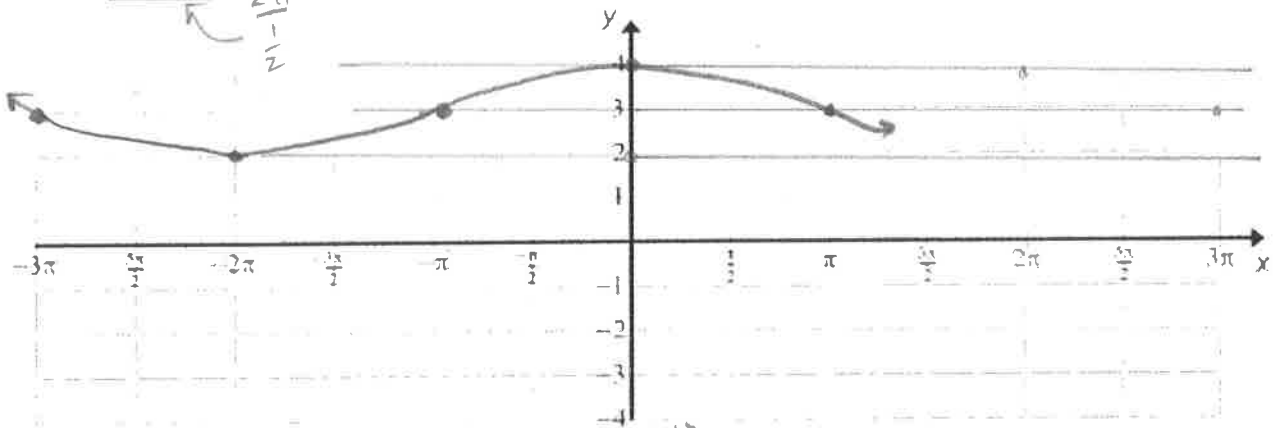
Midline: $y=3$

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

Period: 4π $\frac{2\pi}{\frac{1}{2}}$

Phase shift: left 2π

Range: $[2, 4]$



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

Amplitude: 2

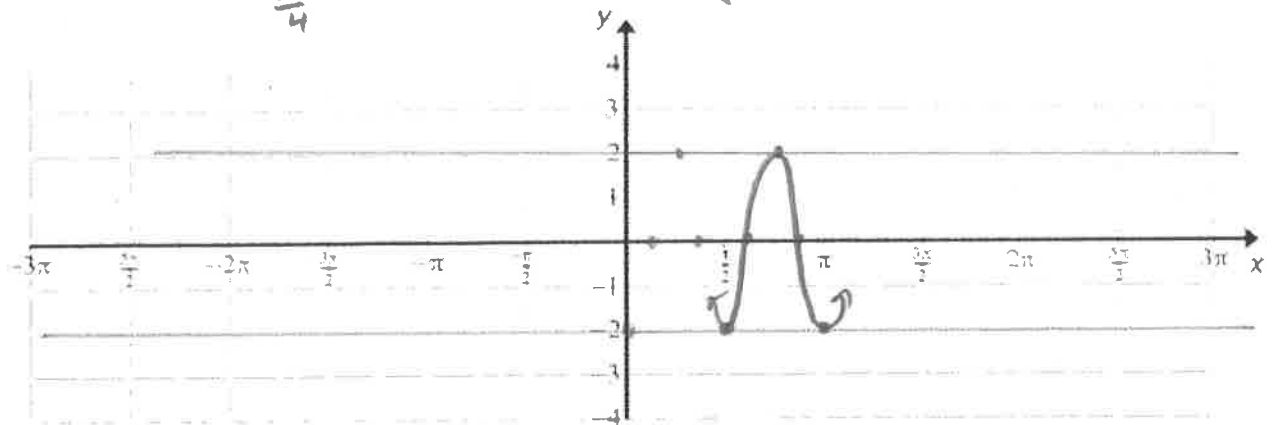
Midline: $y=0$

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

Period: $\frac{\pi}{2}$ $\frac{2\pi}{4}$

Phase shift: right $\frac{\pi}{2}$

Range: $[-2, 2]$



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

Amplitude: 4

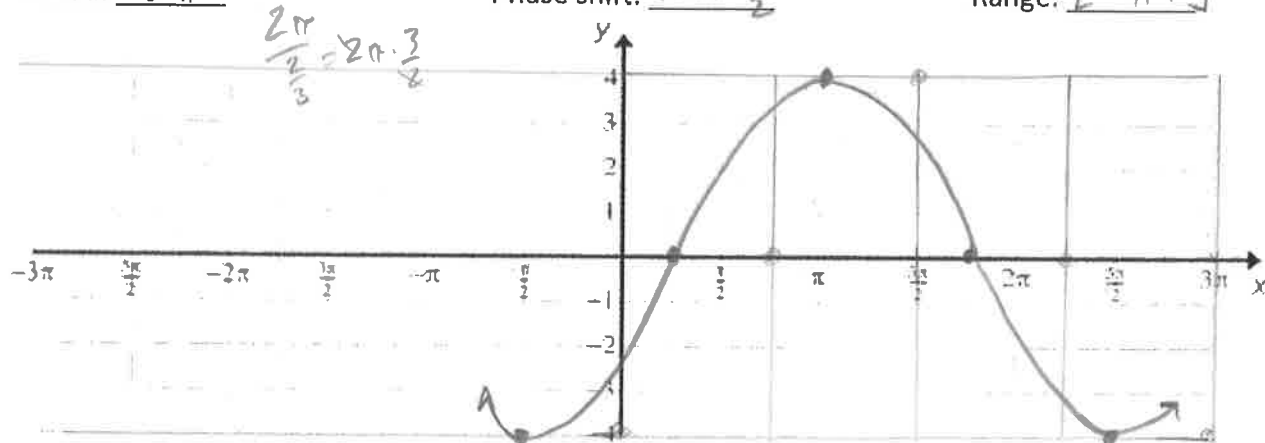
Midline: $y=0$

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

Period: 3π

Phase shift: left $\frac{\pi}{2}$

Range: $[-4, 4]$



CHECK FOR UNDERSTANDING:

$y = -2 \sin\left(2\left(x + \frac{3\pi}{2}\right)\right) + 1$

Amplitude: 2

Midline: $y=1$

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

Period: π $\leftarrow \frac{2\pi}{2}$

Phase shift: left $\frac{3\pi}{2}$

Range: $[-1, 3]$

