Key

# Worksheet Math 1316 -Plane Trigonometry

## Unit 2: Section 4.1-4.2 Graphing Trig Functions

### Things to Remember:

Unit Circle:

- NEED to have this memorized!

- Will help you graph SIN and COS Functions

- Cosine Functions start on a max at 1

- Sin Functions start in the middle at 0

adding
y=C+sin(x) moves up and down ↕

multiply
y=Asin(x) [redacted] vertically stretches ↕

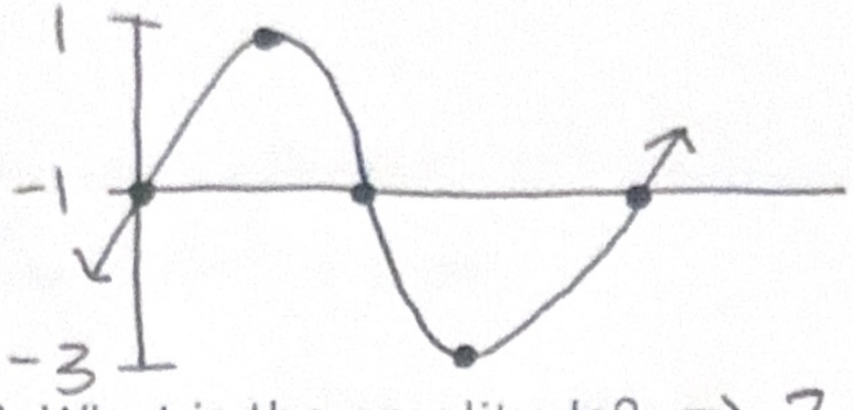
y=sin(x+D) moves left and right ↔

adding in ( )

y=sin (Bx) [redacted] stretches/shrinks horizontaly ↔

multiplying in ( )

$y = 2\sin(x) - 1$ → MHMLM




- amp (2) max
- midline
- amp (2) min

e) What is the amplitude? → 2

why? b/c #2 infront of sin(x)

f) What is the midline? → $y = -1$

why? b/c -1 means down 1

## Vertical Transformations

Describe the Transformations that occur in...

$y = -3\cos(x) + 2$ ← +2

↑ negative sign

- negative sign means it reflects the graph over the x-axis
- 3 → vertical stretch (amplitude of 3)
- +2 → shift graph up 2 (midline $y = 2$)

sketch: $-\cos(x)$ → LMHML (switched)


* Compare to $y = \cos(x)$ *

Write an equation for a sine function that includes

- Amplitude of 5 → place in front of sin(x)
- Has a midline of $y = 1$ → +1

$y = 5\sin(x) + 1$

Describe the phase shift of...

$y = \cos(x - \pi/4)$

remember x's lie

meaning

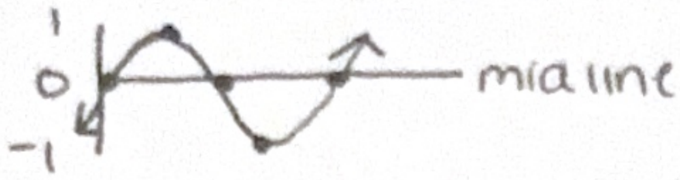
"−" → right

"+" → left

- Phase shifts right $\frac{\pi}{4}$ graph starts @ $\frac{\pi}{4}$

M = mid  L = LOW  H = high

Sin Functions Pattern: M H M L M




Cos Functions Pattern: H M L M H

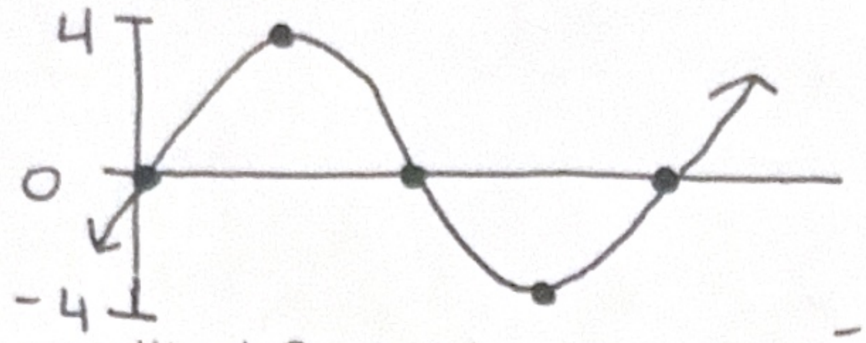

I like to write this before even trying to figue out the details of a graph.

Practice Problems:

<u>Amplitude & Midline</u>

1) $y=-4\sin(x)$ → sin function → M H M L M

Draw Function:




a) What is the amplitude? → 4

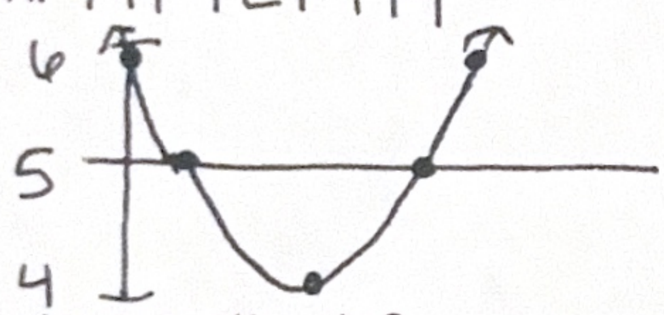
why? b/c amplitude has an absolute value meaning $|-4| = 4$ (no neg amps)

b) What is the midline? → y=0

why? b/c no # added or subtrated

2) $y=\cos(x)+5$

Draw Function: H M L M H




c) What is the amplitude? → 1

why → b/c no # infront of cos(x)

d) What is the midline? → y = 5

why? b/c +5 means up five

3) $y=2\sin(x)-1$

Draw Function:

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