

Colored pencils

# Chapter 8

## LT 1 Day 2

Colored pencils

I can graph the six trig functions and give key information including zeros, asymptotes, end behavior, period, midline, and amplitude.

### Sine and Cosine graphs with Shifts

Sine

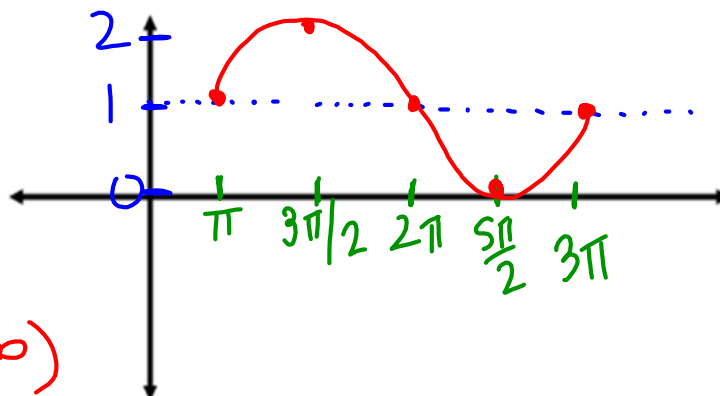
$$y = A \sin B(x \pm C) \pm D$$

Cosine

$$y = A \cos B(x \pm C) \pm D$$

- $|A| = \text{Amplitude}$  (always positive and it's how high the graph stretches vertically from the midline)
- $B = \text{Period}$  (how long it takes to make one complete curve)
- $\pm C = \text{Horizontal Shift}$  (how far the graph moves left or right)
- $\pm D = \text{Vertical Shift}$  (how far the graph moves up or down)

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

Amplitude: 1Period:  $2\pi$ H.S:  $\pi$ V.S: 1Domain:  $(-\infty, \infty)$ Range:  $[0, 2]$ 

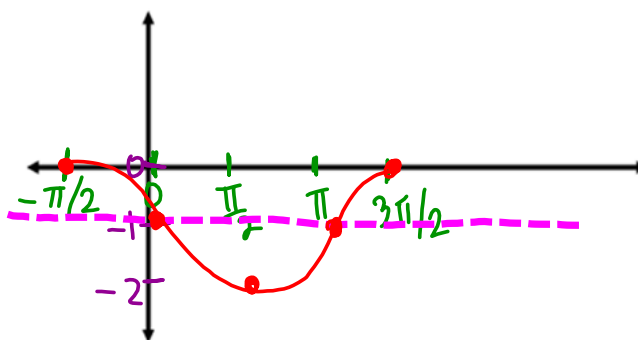
$$\begin{aligned} 0 + \pi &= \pi \\ \pi/2 + \pi &= 3\pi/2 \\ \pi + \pi &= 2\pi \\ 3\pi/2 + \pi &= 5\pi/2 \\ 2\pi + \pi &= 3\pi \end{aligned}$$

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

Amplitude: 1Period:  $2\pi$ H.S:  $\frac{\pi}{2}$ V.S: -1

Domain: \_\_\_\_\_

Range: \_\_\_\_\_



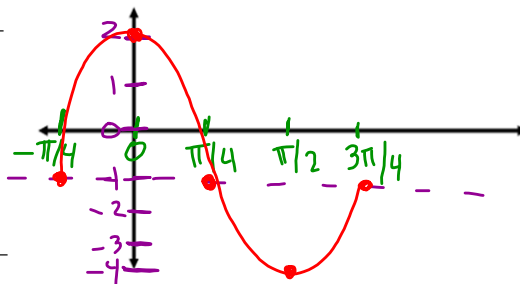
$$\begin{aligned} 0 - \frac{\pi}{2} &= -\pi/2 \\ \frac{\pi}{2} - \frac{\pi}{2} &= 0 \\ \frac{2\pi}{2} - \frac{\pi}{2} &= \pi/2 \\ \frac{3\pi}{2} - \frac{\pi}{2} &= \pi \\ \frac{4\pi}{2} - \frac{\pi}{2} &= \frac{3\pi}{2} \end{aligned}$$

$$3.) y = 3 \sin 2 \left( x + \frac{\pi}{4} \right) - 1 \quad 2\pi \div \frac{2}{1} = 2\pi \cdot \frac{1}{2} = \pi$$

Amplitude: 3Period:  $\pi$ H.S:  $\frac{\pi}{4}$ V.S: 1

Domain: \_\_\_\_\_

Range: \_\_\_\_\_



$$0 \cdot \frac{1}{2} = 0 - \frac{\pi}{4} = -\frac{\pi}{4}$$

$$\frac{\pi}{2} \cdot \frac{1}{2} = \frac{\pi}{4} - \frac{\pi}{4} = 0$$

$$\frac{\pi}{1} \cdot \frac{1}{2} = \frac{2\pi}{4} - \frac{\pi}{4} = \frac{\pi}{4}$$

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

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

$$4.) y = -\cos \left\{ \frac{1}{4} \left( x - \frac{\pi}{2} \right) \right\} - 2$$

Amplitude: \_\_\_\_\_

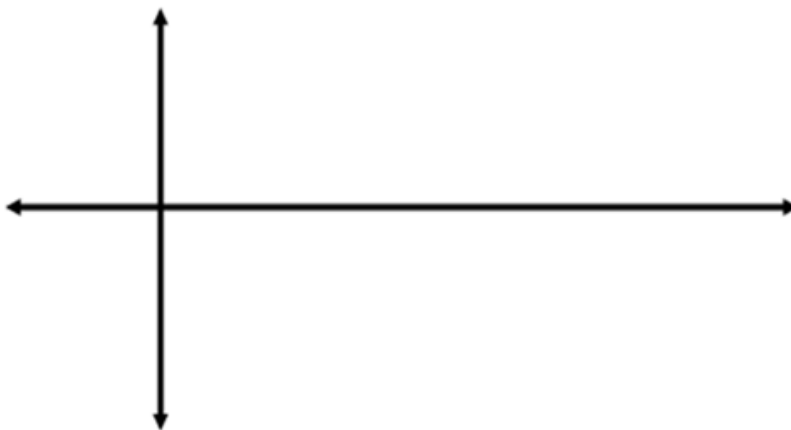
Period: \_\_\_\_\_

H.S: \_\_\_\_\_

V.S: \_\_\_\_\_

Domain: \_\_\_\_\_

Range: \_\_\_\_\_



$$5.) y = -\frac{1}{2}\sin(3x - \pi)$$

Amplitude: \_\_\_\_\_

Period: \_\_\_\_\_

H.S: \_\_\_\_\_

V.S: \_\_\_\_\_

Domain: \_\_\_\_\_

Range: \_\_\_\_\_

