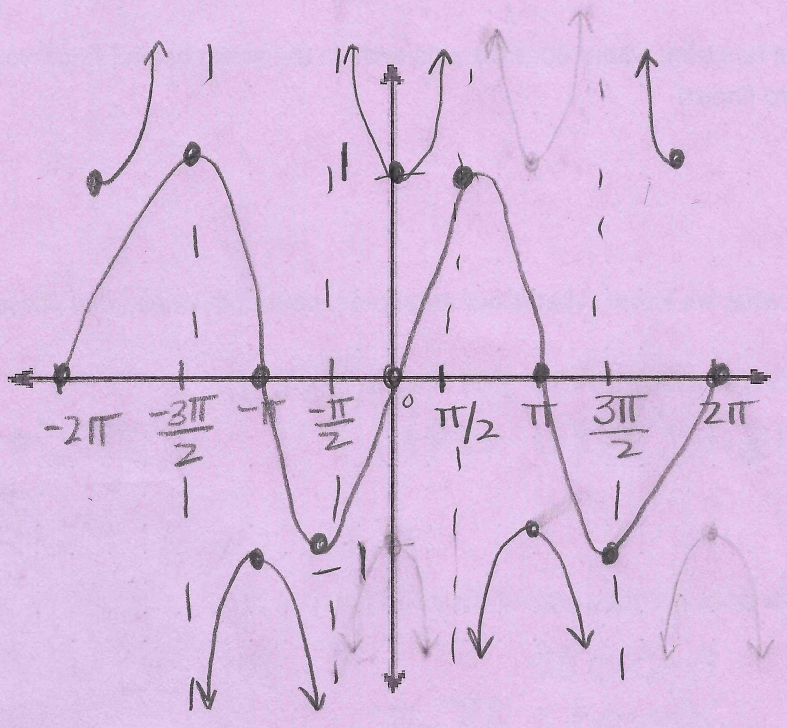
Name: Key!

7.4 A Other Trigonometric Graphs

1. Graph the *sint* function on the graph below from $[-2\pi, 2\pi]$.Show the proper bench marks and range values.



2. Graph *sect* on the same graph above from $[-2\pi, 2\pi]$.

$\sec t = \frac{1}{\cos t}$

State the range of the function: $y \geq 1$ $y \leq -1$

Asymptotes: $\frac{\pi}{2}, \frac{3\pi}{2}$

State the asymptotes of the function:

$\frac{\pi}{2}, \frac{3\pi}{2}, \frac{-\pi}{2}, \frac{-3\pi}{2}$

3. Find a sine function whose graph looks like the graph of $g(t) = 3\sin(2t + 1) + 4\cos(2t - 3)$.

Step 1: By using the minimum and maximum values on your graphing calculator, find the amplitude of this function. 2.61

Step 2: Find the period of $\sin(2t + 1)$ and $\cos(2t - 3)$.

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

Step 3: Using the periods that you found in step 2, what does that tell us about the period of $g(t) = 3\sin(2t+1) + 4\cos(2t-3)$?

π Same.

Step 4: We are looking for a sine function, where does the sine cycle in the graph begin? (Hint: you will need to use your calculators zero finder)

$\approx .29$

Step 5: Generate a function for what we know, what is our amplitude, period, b- value , and phase shift.

Write an equation in the form $f(t) = a\sin(bt + c)$ or $f(t) = a\sin\left(b\left(t + \frac{c}{b}\right)\right)$.

$f(t) = 2.61\sin(2(t - .29))$

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

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

Find a sine function whose graph looks like the graph of the given function $f(t)$.

4. $f(t) = 2sin4t - 5cos4t$

A: 5.385

$g(t) \approx 5.385\sin(4(t - .2976))$ Period: $\frac{2\pi}{4} = \frac{\pi}{2}$

Shift: $\approx .2976$

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

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

5. $f(t) = -5\sin(3t+2) + 2\cos(3t-1)$

$g(t) \approx 5.116\sin(3(t - .248))$

A: 5.116

Per: $\frac{2\pi}{3}$

Phase shift: .248 right

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

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

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

6. $f(t) = 0.3\sin(2t+4) - .4\cos(2t-3)$

$g(t) \approx .3038\sin(2(t - .295))$

A: .3038

$p = \pi\left(\frac{2\pi}{2}\right)$

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

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

shift: .295

7. Find a viewing window for one complete cycle of $f(t) = 3sin50\pi t + 4cos20\pi t$.

a.) Find the period of $3sin50\pi t$. $\frac{2\pi}{50\pi} = P$ $P = 1/25\ (.04)$

b.) Find the period of $4cos20\pi t$.

$\frac{2\pi}{20\pi} = (.1)\ \frac{1}{10}$

*The period of the function is the least common multiple of the periods of the two separate sub functions (part a and b).

.2 is the smallest product common in both.

c.) Find the period of $f(t) = 3sin50\pi t + 4cos20\pi t$.

least common multiple is .2.

→ one cycle in .2.

d.) Find a viewing window for one complete cycle of $f(t) = 3sin50\pi t + 4cos20\pi t$.

$0 \le t \le .2$

Find a viewing window that shows a complete graph of the function.

8. $h(t) = sin300t + cos500t$

$0 \le t \le \pi/50$

$-2 \le Y \le 2$ ← kept to see that specific period.

$\frac{2\pi}{300} = \frac{\pi}{150}$

$\frac{2\pi}{500} = \frac{\pi}{250}$

> least common multiple $\frac{\pi}{50}$

9. $f(t) = 4sin0.2\pi t - 5cos0.4\pi t$

Period: $\frac{2\pi}{.2\pi} = 10$ (10-1 10-2) Period: $\frac{2\pi}{.4\pi} = 5$ (5-1 5-2)

LCM: 10

#21 Describe the graph of the function. Describe the asymptotes, amplitude, and number of waves between 0 and 2π. Think about what lines these graphs lie between. Make sure to look at your table values to help.

10. $h(t) = \frac{1}{t}sint$ no asymp.

- looking at table: there's a hole @ (0,1)
- amplitude decreases as more farther from origin

11. $g(t) = sine^t$

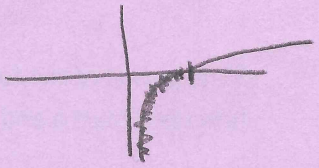
#17 - waves move slowly closer to origin then rapidly increase as get farther

→ same amplitude 1, but shorter & shorter period.

12. $h(t) = ln|cost|$

#23 → Graph lies on or below the t-axis because log function is neg. for #'s between 0 & 1.

$|cost|$ is always between 0 & 1.



→ vertical asymptotes

$cost = 0$

$t = \pm\frac{\pi}{2}, \pm\frac{3\pi}{2}, \pm\frac{5\pi}{2} \ldots$

$ln(0)$ is not defined