Homework 8-1

Graphing Quiz Wednesday Days 1 - 3
Omit #18 on tonight's HW 8-2
You need your calculator today

1. See graph

2a. 1 2b. -1

3. $[-1, 1]$

4. $\{\pi/2\}$

5. $\{3\pi/2\}$

6a. $(0, \frac{\pi}{2})$ and $(\frac{3\pi}{2}, 2\pi)$

6b. $(\frac{\pi}{2}, \frac{3\pi}{2})$

7. See graph

8a. 1 8b. -1

9. $[-1, 1]$

10. $\{0, 2\pi\}$

11. $\{\pi\}$

12a. $(\pi, 2\pi)$

12b. $(0, \pi)$

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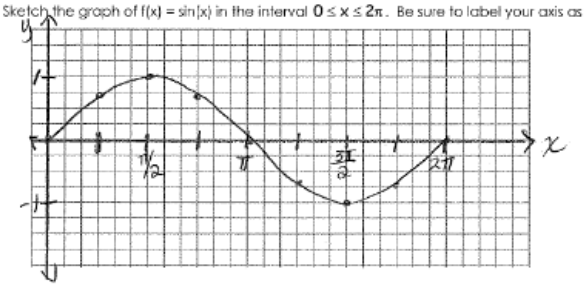
Name: Key Algebra 2 Homework 11-1

Period : _____

1. Sketch the graph of f(x) = sin|x| in the interval $0 \le x \le 2\pi$. Be sure to label your axis as in class.



2. a. What is the largest value of f(x) = sin|x|? 1

b. What is the smallest value of f(x)= sin|x|? -1

3. What is the range of f(x) = sin|x|? $[-1, 1]$ or $\{y \mid -1 \le y \le 1\}$

4. For what value(s) of x in the interval $0 \le x \le 2\pi$ is sin|x| = 1? $x = \pi/2$

5. For what value(s) of x in the interval $0 \le x \le 2\pi$ is sin|x| = -1? $x = 3\pi/2$

6. Between what values in the interval $0 \le x \le 2\pi$ is sin|x|:

a. increasing? $(0, \frac{\pi}{2})$ and $(\frac{3\pi}{2}, 2\pi)$

b. decreasing? $(\frac{\pi}{2}, \frac{3\pi}{2})$

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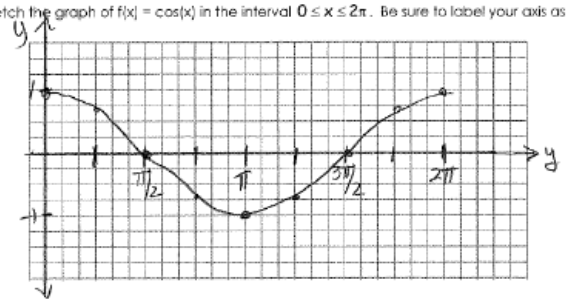
7. Sketch the graph of f(x) = cos(x) in the interval $0 \le x \le 2\pi$. Be sure to label your axis as in class.



8. a. What is the largest value of f(x) = cos(x)? 1

   b. What is the smallest value of f(x) = cos(x)? −1

9. What is the range of f(x) = cos(x)? $[-1, 1]$

10. For what value(s) of x in the interval $0 \le x \le 2\pi$ is cos(x) = 1? $\{0, 2\pi\}$

11. For what value(s) of x in the interval $0 \le x \le 2\pi$ is cos(x) = -1? $\{\pi\}$

12. Between what values in the interval $0 \le x \le 2\pi$ is cos(x):

    a. increasing? $(\pi, 2\pi)$

    b. decreasing? $(0, \pi)$

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Day 2: Review Basic Sine, Cosine and Tangent Graphs
Amplitude, Frequency, Period, Domain & Range, x interval

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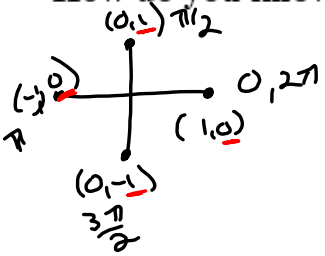
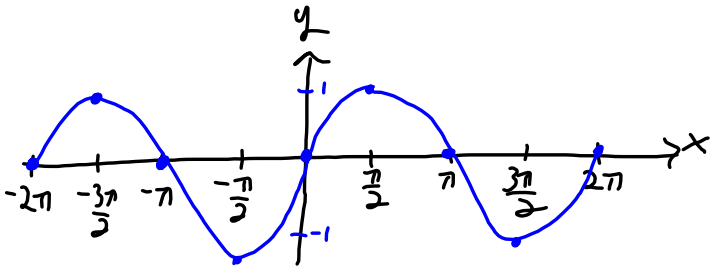
$y = \sin x$

Sketch f(x) = sin (x). Is this function odd or even? Odd

How do you know? Symmetrical thru the origin or Rotation 180°





$y = \sin x$

$(0, 1, 0, -1, 0)$

*

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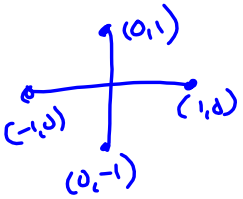
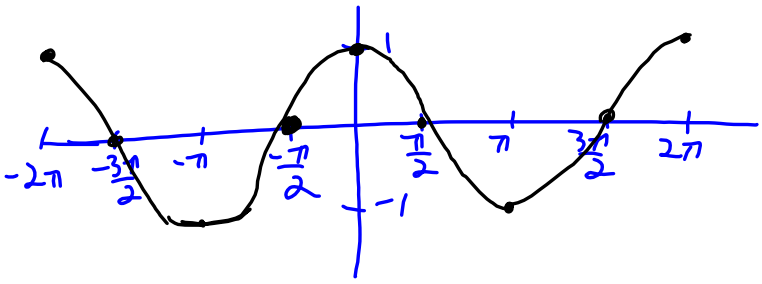
Sketch f(x) = cos (x). Is this function odd or even? Even

How do you know? Symmetrical about the y-axis



$y = \cos x$

$(1, 0, -1, 0, 1)$



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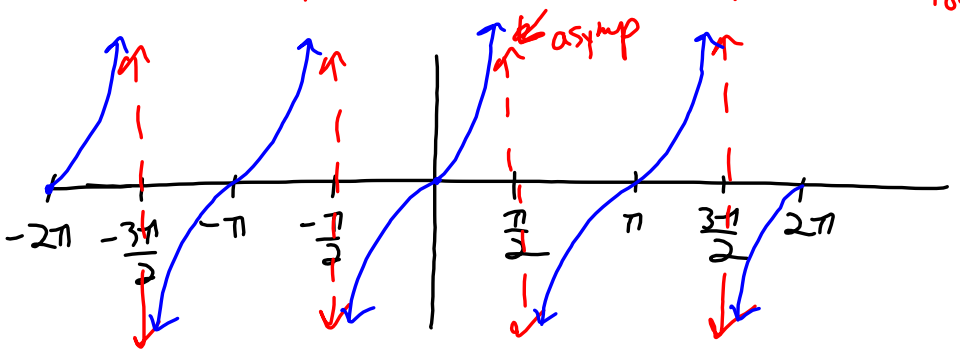
Sketch f(x) = tan (x). **Is this function odd or even?** Odd

How do you know? Symmetrical thru the origin or $R_{180°}$



* always increasing

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f(x) = Asin(ω(x)) +k (0, 1, 0, -1, 0) **f(x) = Acos(ω(x)) +k** (1, 0, -1, 0, 1)

$y=\sin(x)$ $y=\cos(x)$

$|A|$ → amplitude → height above and below the midline

$\frac{|\omega|}{2\pi}$ → frequency → $|\omega|$ = #cycles in 2π

$\frac{2\pi}{|\omega|}$ → period → length of one full cycle (reciprocal of frequency)

y = k → (horizontal) midline (vertical shift)

interval on x-axis = (Xscl) $\frac{\text{period}}{4}$ is the distance between pattern points on the x-axis

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On calculator: Compared frequencies
- f(x) = sin(x) – 1 cycle in $2\pi \to \frac{1}{2\pi}$
- f(x) = sin(½x) – ½ cycle in $2\pi \to \frac{1/2}{2\pi}$
- f(x) = sin(2x) – 2 cycles in $2\pi \to \frac{2}{2\pi}$

mode–radians

Window
Xmin=0
max=2π
Xscl=π/2
Ymin=-2
max=2
Yscl=1

On calculator: Compared amplitudes
- f(x) = sin(x) amplitude=1, range $-1 \le y \le 1$
- f(x) = ½sin(x) amplitude=½, range $-\frac{1}{2} \le y \le \frac{1}{2}$
- f(x) = 2sin(x) amplitude=2, range $-2 \le y \le 2$

On calculator: transformation?
f(x) = sin (x)
f(x) = -sin (x) → reflection in x-axis

reflection in x axis.

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Amplitude with Frequency Changes

$f(x) = A\sin(\omega x) + k$

1. Given f(x) = 3 sin(2x) tell $(0 \le x \le 2\pi)$

a. amplitude $= |A| = |3| = 3$

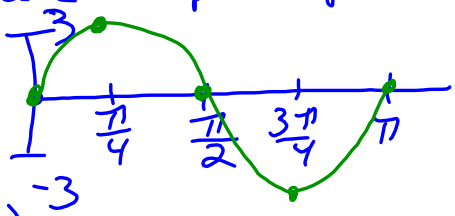
b. range $= [-3, 3]$

c. frequency $= \frac{|\omega|}{2\pi} = \frac{2}{2\pi}$ → 2 cycles in 2π

d. period $= \frac{2\pi}{\omega} = \frac{2\pi}{2} = \pi$ (length of 1 full cycle)

e. interval on x-axis $= \frac{\text{per}}{4} = \frac{\pi}{4}$ scale to plot points

f. describe the following:



i. minimums → $(\frac{3\pi}{4}, -3)$

ii. maximums → $(\frac{\pi}{4}, 3)$

iii. zeros → $(0,0), (\frac{\pi}{2}, 0), (\pi, 0)$

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2. Given f(x) = -2 cos(½x) tell $(-2\pi \le x \le 2\pi)$

a. amplitude $= |A| = |-2| = 2$

b. range $[-2, 2]$

c. frequency $= \frac{\omega}{2\pi} = \frac{1/2}{2\pi} = \frac{1/2}{2\pi/1} = \frac{1}{2} \cdot \frac{1}{2\pi} = \frac{1}{4\pi}$

d. period $= \frac{2\pi}{\omega} = \frac{2\pi}{1/2} = 2\pi \cdot \frac{2}{1} = 4\pi$ (length of 1 full cycle)

e. interval on x-axis $\frac{\text{Pe}}{4} = \frac{4\pi}{4} = \pi$

f. describe the following:

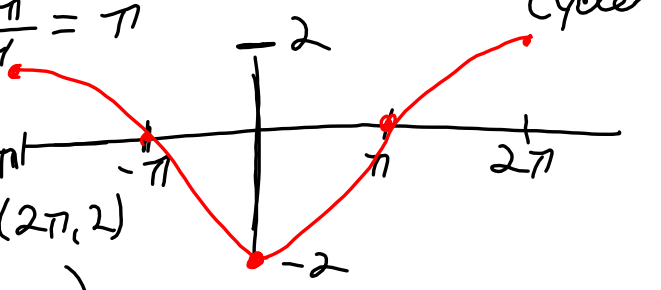
i. minimums → $(0, -2)$

ii. maximums → $(-2\pi, 2)$ $(2\pi, 2)$

iii. zeros → $(-\pi, 0)$ $(\pi, 0)$

$y = f(x)$

0 +2 -2



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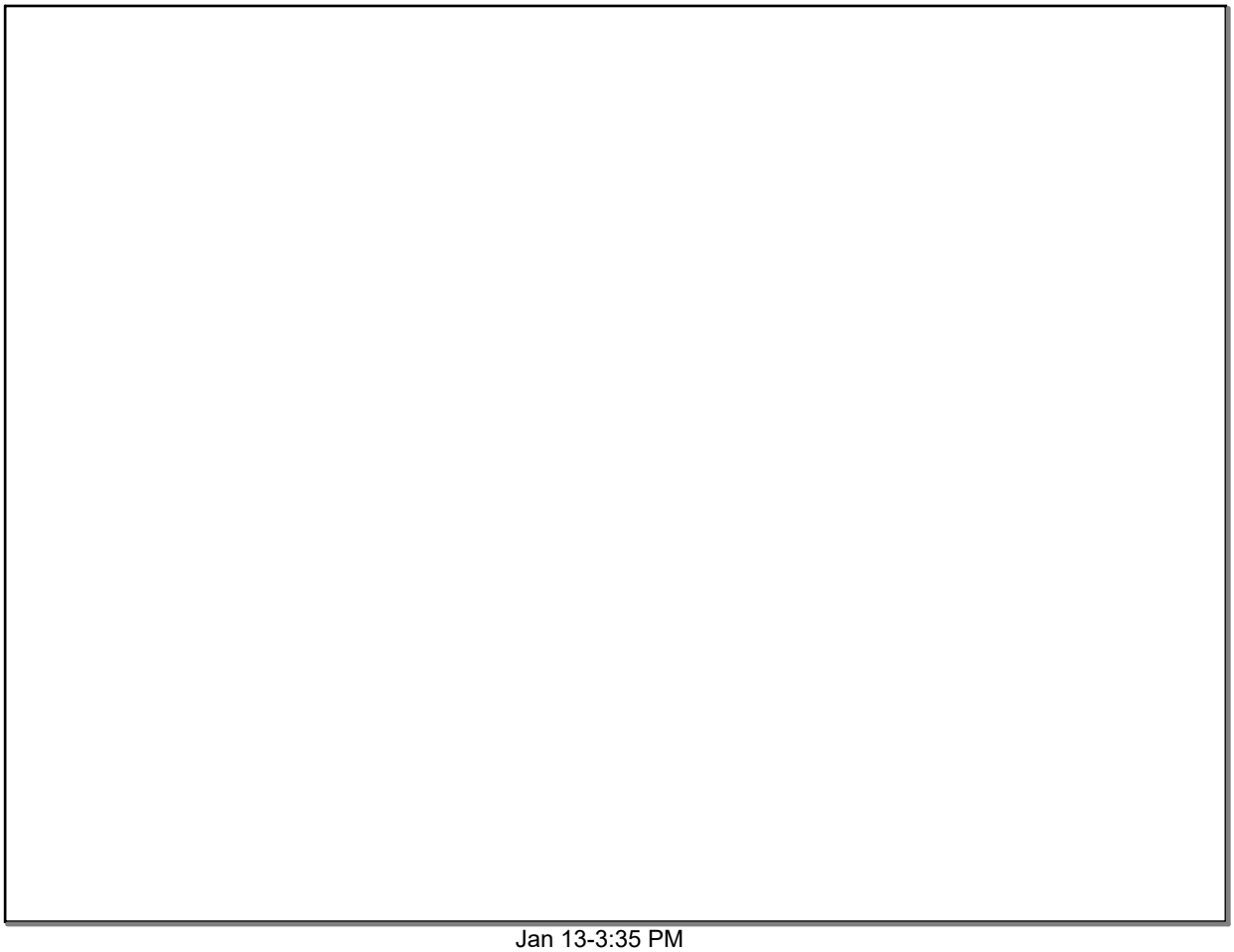
Not in notes - Try on your calculator.

Unwrap the Unit Circle on your calculator!

mode = radian, parametric, simultaneous
window: T min/max = 0 to 2pi, pi/175
x: min/max = -pi/2 to 2pi, xscl = pi/2
y: min/max = -2.5 to 2, yscl = 1
y= : X_{1T} = cos(T)
Y_{1T} = sin(T)
X_{2T} = T
Y_{2T} = sin(T)
GRAPH

Jan 9-7:30 PM



Jan 13-3:35 PM