MATH-8 TEST Unit 2
SAMPLE

100 points **NAME:**____________________

This test is in two parts. On part one, you may not use a calculator; on part two, a (non-graphing) calculator is necessary. When you complete part one, you turn it in and get part two. Once you have turned in part one, you may not go back to it. You will show all work on the test paper, no scratch paper is allowed.

PART ONE - NO CALCULATORS ALLOWED

(1) Find the following Trig Values, exactly *(2 points each)*

$\cos(7\pi/6) =$ $-\sqrt{3}/2$ $\cot(\pi/3) =$ $\sqrt{3}/3$ $\tan(5\pi/6) =$ $-\sqrt{3}/3$

$\sin(3\pi/4) =$ $\sqrt{2}/2$ $\cos(17\pi/6) =$ $-\sqrt{3}/2$ $\cos(\pi) =$ -1

$\tan(\pi/2) =$ undefined $\sin(-2\pi/3) =$ $-\sqrt{3}/2$ $\sin(3\pi/2) =$ -1

$\sin(5\pi/3) =$ $\sqrt{3}/2$ $\tan(4\pi/3) =$ $\sqrt{3}$ $\tan(\pi) =$ 0

(2) Solve the following equations for the given restriction on t. (If no restriction is given, find all solutions)
(4 points each)

(a) Solve: $\sin(t) = \frac{\sqrt{2}}{2}$ $\frac{\pi}{4} + 2\pi k,\ \frac{3\pi}{4} + 2\pi k,\ k$ integer

(b) Solve: $\cos(t) = -\frac{1}{2}$ for $0 \le t < 2\pi$ $\frac{2\pi}{3},\ \frac{4\pi}{3}$

(c) Solve: $\tan(t) = \sqrt{3}$ $\frac{\pi}{3} + \pi k$, k integer

(d) Solve: $\sin(t) = 1$ $\pi/2 + 2\pi k$

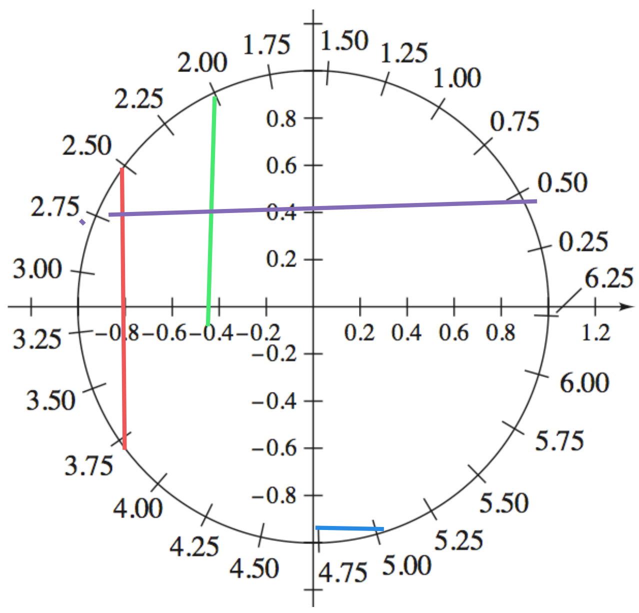
(e) Solve: $\sec(t) = 2$ for $0 \le t < 2\pi$ $\frac{\pi}{3},\ \frac{5\pi}{3}$

(2) Use the figure to *(1 points each)*

(a) approximate the value of sin 5 .95 cos 2 −.45

(b) find a value of t such that cost ≈ -0.8 2.5 3.75

(c) find a value of t such that sint ≈ 0.4 .5, 2.75



NAME: ____________

MATH 8 Sample Test 2

PART TWO - CALCULATORS ALLOWED (non-graphing)

Show your work on this paper. EXACT answers are expected unless otherwise specified. Show scales on graphs and label highs and lows. Give units in answers when appropriate.

Fill in the blanks. (2 points each)

(1) $f(t)=\sin(t)$ Is even, odd, or neither odd

(2) What is the amplitude of $f(t)=-\frac{1}{2}\sin(3t+\pi)-4$? 1/2

(3) What is the range of $f(t)=\sin(t)$? [-1, 1]

(4) In which quadrant, if any, is $\tan(t)<0$ and $\sin(t)>0$ (both true) II

(5) The domain of $f(x)=\cot(x)$ $x \neq \pi k$, k integer

$\cot(t)=\frac{x}{y}$

$y=0$

(6) Using your calculator, find approximations for the following, correct to 2 decimal places. (1 point each)

(a) $\tan(-3\pi/8)\approx$ -2.41 (b) $\cos(4)\approx$ -.65 (c) $\csc(-2.8)\approx$ -2.99

(7) Given $\cos(t)=-\frac{5}{13}$, with t in Quadrant II, find: (2 points each)

(a) $\sin(t)=$ $-12/13$

(b) $\sec(t)$ $-13/5$

$\sin^2 t+\cos^2 t=1$

$\sin^2 t+(-\frac{5}{13})^2=1$

$\sin^2 t=1-\frac{25}{169}=\frac{144}{169}$

$\sin t=\pm\frac{12}{13}$

y

(8) Given $\tan(t)=-2$ and $\cos(t)<0$ in, find (2 points each)

(a) $\sin(t)=$ $2\sqrt{5}/$

(b) $\cos(t)$ $-\frac{1}{\sqrt{5}}$ or $-\frac{\sqrt{5}}{5}$

$\tan^2 t+1=\sec^2 t$

$(-2)^2+1=\sec^2 t$

$5=\sec^2 t$

$\sec t=\pm\sqrt{5}$

$\sec t=-\sqrt{5}$

Q II

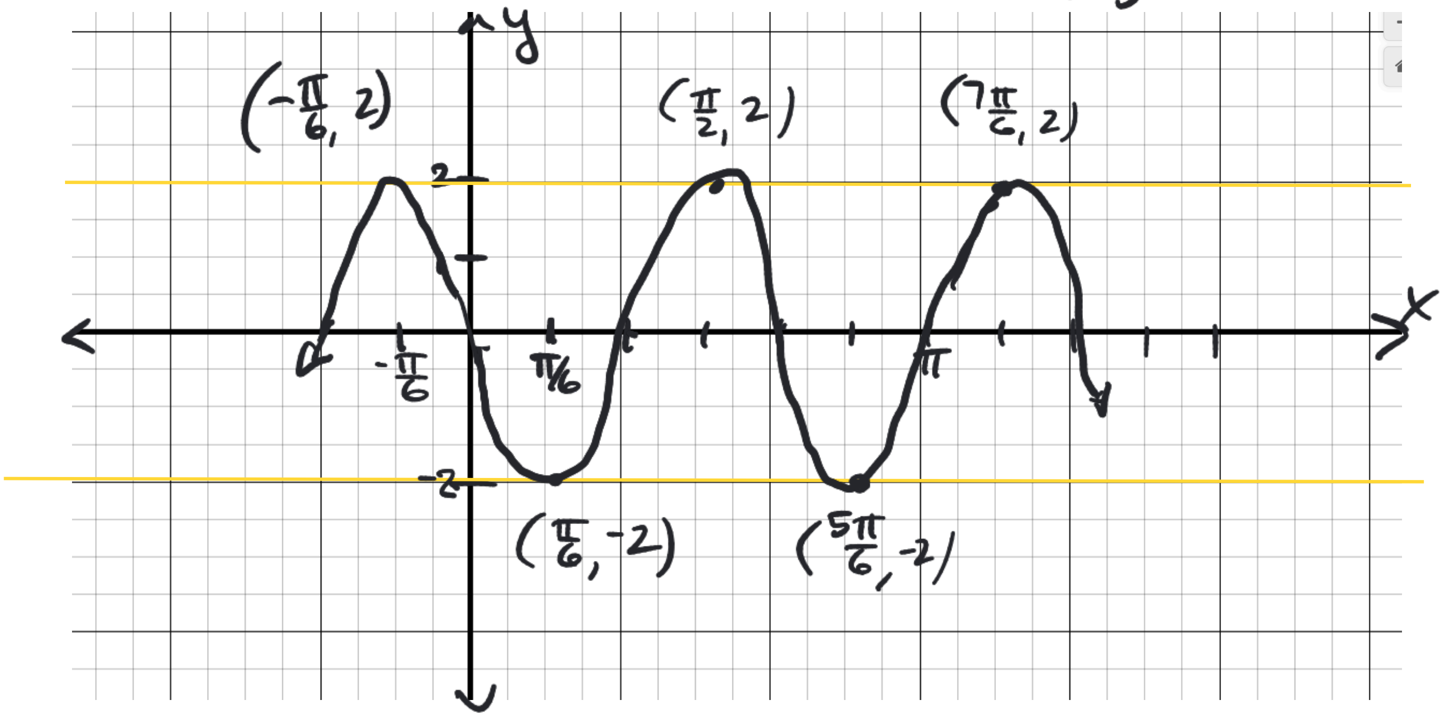
$\tan t=\frac{\sin(t)}{\cos(t)}$

$\tan t\cos t=\sin t$

$(-2)(-\frac{\sqrt{5}}{5})=\frac{2\sqrt{5}}{5}$

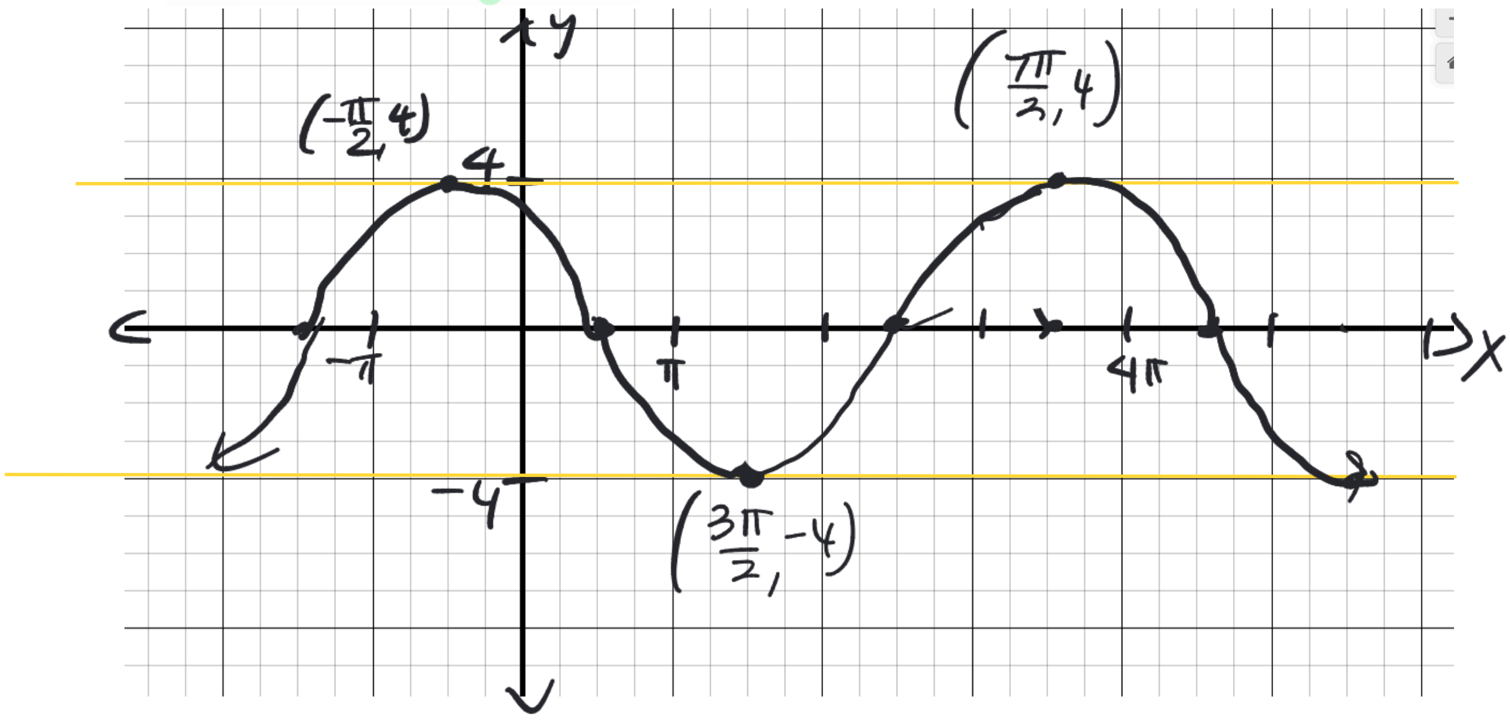
(9) Sketch the following graph. (clearly show scale, graph at least one period, label coordinates of highs and lows) (6 points)

$f(x) = -2\sin(3x)$ period $= \frac{2\pi}{3}$ $\frac{1}{4}$ period $= \frac{1}{4} \cdot \frac{2\pi}{3} = \pi/6$



(10) Sketch the following graph. (clearly show scale, graph at least one period, label coordinates of highs and lows) (8 points)

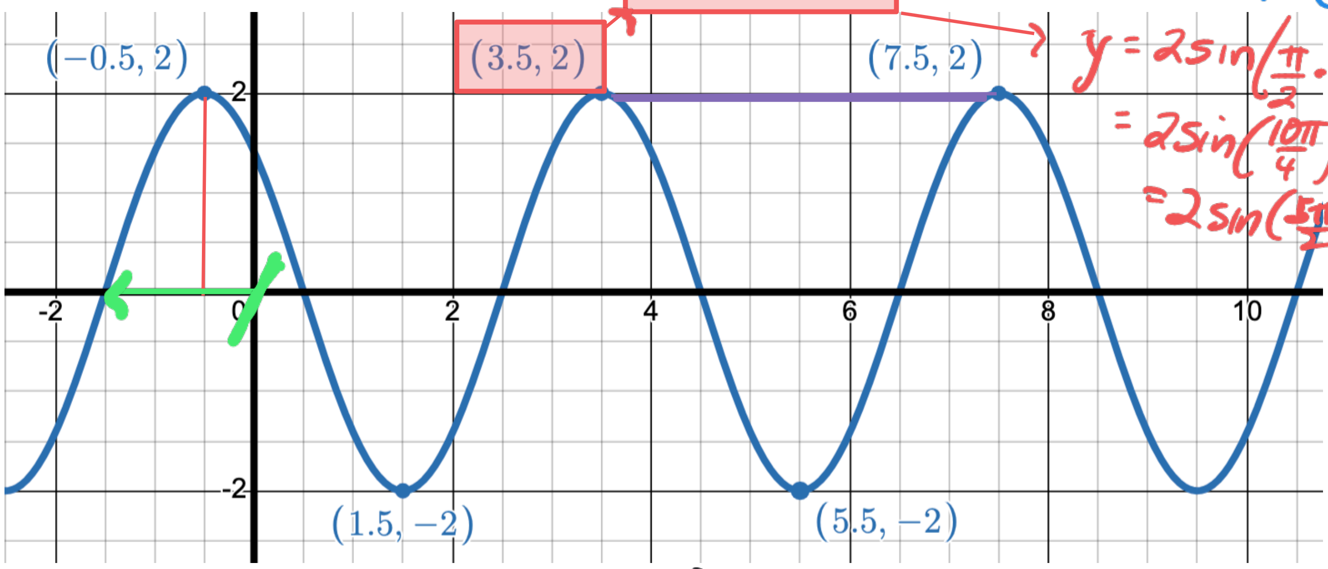
$f(x) = 4\cos\left(\frac{1}{2}x + \frac{\pi}{4}\right) = 4\cos\left(\frac{1}{2}\left(x + \frac{\pi}{2}\right)\right)$



period $= \frac{2\pi}{1/2} = 4\pi$ quarter period $= \pi$

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

(11) Find an equation corresponding the graph below. Show check for a point. (6 points) $(3.5,2)=\left(\frac{7}{2},2\right)$



$y = 2\sin\left(\frac{\pi}{2}\cdot\frac{7}{2}+\frac{3\pi}{4}\right) = 2\sin\left(\frac{10\pi}{4}\right) = 2\sin\left(\frac{5\pi}{2}\right) = 2(1) = 2$

Amplitude=2

period $= 4 \Rightarrow \frac{2\pi}{k}=4 \Rightarrow k=\frac{\pi}{2}$,

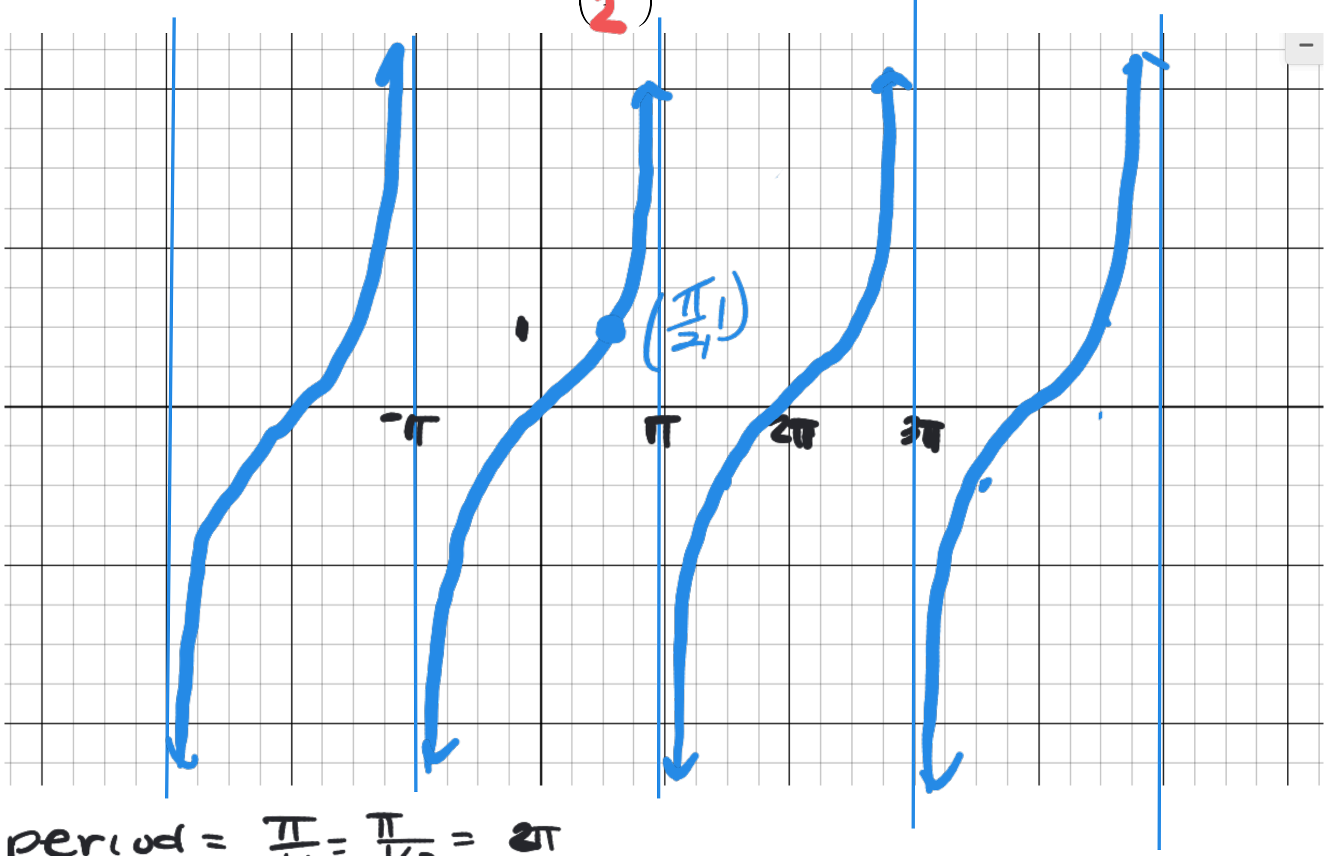
shift: many ways to look at it...

sine shift 3/2 left

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

$y = 2\sin\left(\frac{\pi}{2}x+\frac{3\pi}{4}\right)$

(12). Sketch the following graph. (clearly show scale, graph at least TWO periods, If there are any asymptotes, label them clearly. $f(x)=\tan\left(\frac{1}{2}x\right)$ *(6 points)*



period $= \frac{\pi}{k} = \frac{\pi}{1/2} = 2\pi$

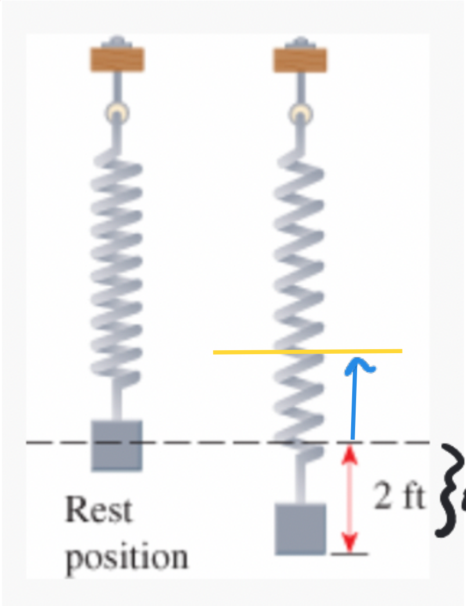
Asymptotes: one at $\frac{1}{2}x = \frac{\pi}{2} \rightarrow x = \pi$

(13) A mass suspended from a spring is pulled down a distance of 2 feet from its rest position as shown. The mass is released from there at time t=0 and is allowed to oscillate in simple harmonic motion. If the mass returns to this position after $\frac{1}{3}$ second, find an equation that describes the motion. (5 points)

period $= \frac{1}{2}$ sec

$$\Rightarrow \frac{2\pi}{k} = \frac{1}{3} \Rightarrow k = 6\pi$$

$$\boxed{f(t) = -2\cos(6\pi t)}$$



}Amp

lo - o - hi - o

- cosine