Name _____ Ku _____
Date _____ Block _____

1) Name the quadrant that the angle x lies in given that sec $x > 0$, and sin $x < 0$.

(cos)

4th Quad.

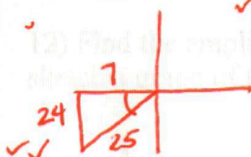2) Name the quadrant that the angle x lies in given that csc $x > 0$, and tan $x < 0$.

(sin)

II Quad

3) Approximate to four decimal places csc 5.9931. (mode)

-3.496

4) Approximate to four decimal places tan 15°. (mode)

$.268$

5) Suppose for an angle θ, cot $\theta = 7/24$ and sec $\theta < 0$. Find the exact value of sin θ.

cos

$\sin \theta = \dfrac{24}{25}$

6) Convert 75° to radian measure.

$75° \cdot \dfrac{\pi}{180°} = \dfrac{5\pi}{12}$

7) Convert $-7\pi/4$ to its exact degree measure and determine the quadrant of the terminal side of the angle.

$-\dfrac{7\pi}{4} \cdot \dfrac{180°}{\pi} = 315°$, IV Quad.

8) Find the complement and supplement of $\pi/5$. $\left(\dfrac{2\pi}{10}\right)$

$C = \dfrac{5\pi}{10} - \dfrac{2\pi}{10} = \dfrac{3\pi}{10}$

$S = \dfrac{10\pi}{10} - \dfrac{2\pi}{10}$

9) Identify the phase shift (horizontal shift), amplitude, and period of $y = 4\sin(3x - \pi)$.
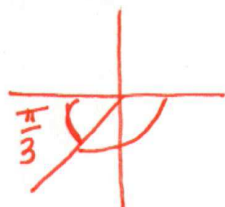
$a = 4$ $P = \dfrac{2\pi}{3}$ $c = $ right $\dfrac{\pi}{3}$

$3\left(x - \dfrac{\pi}{3}\right)$

10) Find the reference angle for θ = -2π/3. Then find the exact values of the six trigonometric functions of θ = -2π/3.

$\frac{\pi}{3}$

$\frac{\pi}{3}$

$\sin\theta = -\frac{\sqrt{3}}{2}$ $\csc\theta = \frac{-2\sqrt{3}}{3}$
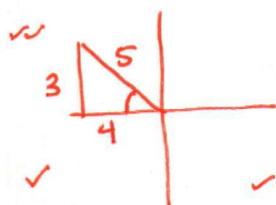
$\cos\theta = -\frac{1}{2}$ $\sec\theta = -2$

$\tan\theta = \sqrt{3}$ $\cot = \frac{\sqrt{3}}{3}$

11) If $\overset{\cos}{\sec}\theta$ = -5/4 and tan θ < 0, find the quadrant of θ and the exact values of the remaining five trigonometric functions of θ.

3   5
  4

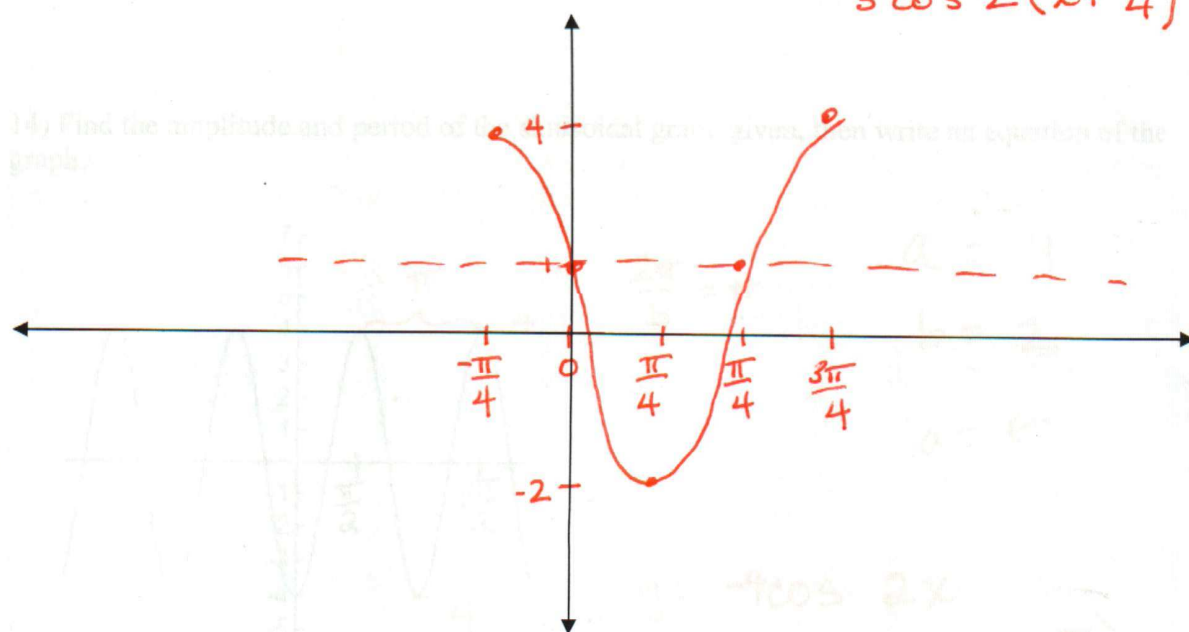$\sin\theta = \frac{3}{5}$ $\csc\theta = \frac{5}{3}$

$\cos\theta = -\frac{4}{5}$ $\cot\theta = -\frac{4}{3}$

$\tan\theta = -\frac{3}{4}$

✓   ✓

12) Find the amplitude, period, and phase shift of the function y = 1 + 3cos(2x + π/2). Then sketch a graph of the equation with one full period. Label the max and min points.

$3\cos 2\left(x + \frac{\pi}{4}\right) + 1$

$a = 3$

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

$c = $ left $\frac{\pi}{4}$

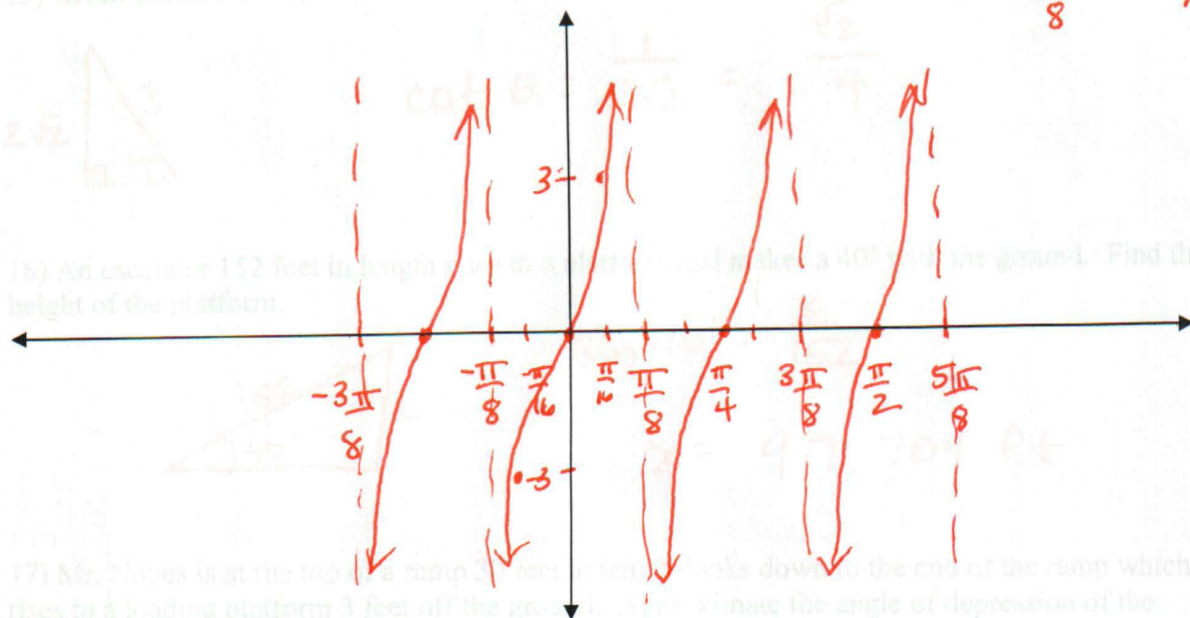$d = $ up 1

Key pts:

$\frac{\pi}{4}$

13) Graph 4 cycles of: f(x) = 3 tan 4x
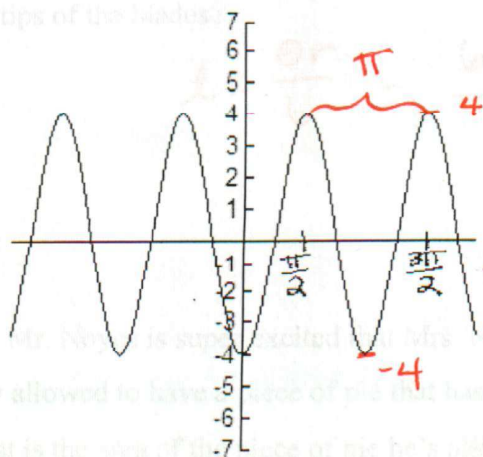
$$4x = \frac{\pi}{2} \qquad 4x = \frac{3\pi}{2}$$

$$x = \frac{\pi}{8} \qquad x = \frac{3\pi}{8}$$

14) Find the amplitude and period of the sinusoidal graph given, then write an equation of the graph.

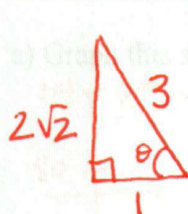$$\frac{2\pi}{b} = \pi$$

$$a = 4$$
$$b = 2$$
$$d = 0$$

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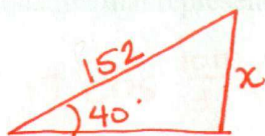
$$y = 4\cos 2\left(x - \frac{\pi}{2}\right)$$

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

15) Given that sec x = 3, find cot x.

$$\cot \theta = \frac{1}{2\sqrt{2}} = \frac{\sqrt{2}}{4}$$

(triangle: hypotenuse 3, side $2\sqrt{2}$, side 1, angle θ)

16) An escalator 152 feet in length rises to a platform and makes a 40° with the ground. Find the height of the platform.

(triangle with 152 hypotenuse, x opposite, 40° angle)

$$\sin 40° = \frac{x}{152}$$

$$x = 97.704 \, ft$$

17) Mr. Noyes is at the top of a ramp 30 feet in length looks down to the end of the ramp which rises to a loading platform 3 feet off the ground. Approximate the angle of depression of the ramp.

(diagram: ramp 30, heights 3 and 3)
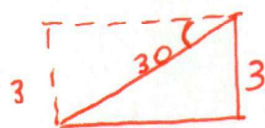
$$\sin \theta = \frac{3}{30}$$

$$\theta = 5.739°$$

18) Mr. Noyes decided to save money on his electric bill and installed a wind machine at his house to generate electricity. The wind machine has propeller blade that are 12 feet in length. If the propeller is rotating at 3 revolutions per second, what is the linear speed in feet per second of the tips of the blades?

$$l = \frac{\theta r}{t} = \frac{6\pi (12) ft}{1 \, sec} = 226.195 \, ft/sec$$

19) Mr. Noyes is super excited that Mrs. Noyes finally made him an apple pie. However, he's only allowed to have a piece of pie that has a radius of 4 inches and a central angle of $\frac{11\pi}{6}$.
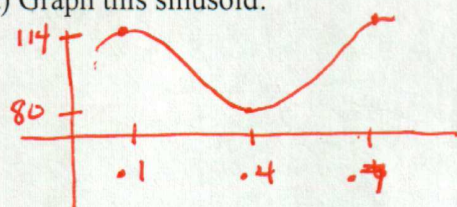
What is the area of the piece of pie he's allowed?

$$A = \frac{1}{2} r^2 \theta \qquad A = \frac{1}{2}(16)\frac{11\pi}{6} = 46.077 \, in^2$$

20) A person's blood pressure reading (measured in mm of mercury, mm Hg) over time is a sinusoid function. Mr. Noyes' blood pressure is at its maximum (systolic) of 114 mm Hg at .1 seconds and his minimum pressure (diastolic) of 80 mm HG at .4 seconds.

a) Graph this sinusoid:

$a = 17$

$P = .6$

$\dfrac{2\pi}{b} = .6$

$b = \dfrac{2\pi}{.6} = \dfrac{10\pi}{3}$

b) Give an equation that represents this sinusoid.

$$P = 17 \cos \dfrac{10\pi}{3}(t - .1) + 97$$

c) Using this information, how many heartbeats does Mr. Noyes have in 1 minute?

I beat every .6 sec $\dfrac{60}{.6} = 100$ beats/min

No Calculator!

21) $\cos 240° = $ _____ $-\dfrac{1}{2}$ _____

22) $\cot 13\pi/6 = $ _____ $\sqrt{3}$ _____

23) $\arcsin(-1/2) = $ _____ $-30°$ _____

24) $\cos^{-1}(-\sqrt{2}/2) = $ _____ $135°$ _____

25) $\csc(\arcsin(12/13)) = $ _____ $\dfrac{13}{12}$ _____

26)   Use the fundamental identities to determine the simplified form of the expression.

$\cos\theta \csc\theta$

$\cos\theta \cdot \dfrac{1}{\sin\theta} =$

$\dfrac{\cos\theta}{\sin\theta} =$

$\cot\theta$