Math 229: Homework Set 2 **Name:**________________________________

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Requirements: In order to receive credit on homework problems, you must

- Write down the original problem, within reason.
- Work out the problem, clearly showing your work.
- Check your answer in the back of the book. If your answer is incorrect, then you need to go back to find and fix the error.

Self-Assessment: Determine total number of correctly done problems (they don't have to be done correctly the first time…just make sure you find and fix any errors in your work!) and put that score in the last column.

If you give credit for a problem that hasn't been completed, you will lose 1 point on the overall grade (for example, if you put down 9/9 in Assignment 1 but have completed only 6 problems, your entire score on the homework packet will lose 3 points). **Please be honest and accurate in your assessment.**

Homework is due on the day of the exam.

	Read this section:	**Do these problems:**	**Completed/ Total**
1	Section 8.1: **Graphs of the Sine and Cosine Functions** Study pages 642 – 649, And 651 - 653	8.1 Exercises, page 656: • Concepts: 1, 2, 5 • Graphing by hand: *Graph these **by hand** then use Desmos to check. Make sure your graphs have the midline dashed in and the quarter points clearly marked:* #7, 8, 9, 11, 12, 13, 22 • Graphing using technology: #22 *Graph the function in #22 using Desmos. Then find another function (cosine) that gives the same graph.*	/10
2	Section 8.1 **and Supplement on Modeling** Study pages 649 – 650 And 653 - 655	8.1 Exercises, page 656: • Finding function from graph: 23, 25, 27, 29 • Supplement: 3 problems (Solutions to the supplement problems are posted online.)	/7
3	Section 8.2: **Graphs of Other Trig Functions** Study pages 659 - 673	8.2 Exercises, page 674 • Identifying basic graphs: 6 – 9 all • Period and phase shift: 10, 11, 12 • Even/odd functions: 13 – 18 all • Graphing secant and cosecant by hand*: Graph each of the functions by first graphing the corresponding cosine or sine graph, then using those to complete the secant or cosecant graph. Dash in the asymptotes. Check using Desmos.* #20, 21, 27, 29, 33, 35 • Graphing tangent, cotangent by hand: *Graph each of the functions by sketching y = tan(x) or y = cot(x) first, then identifying and performing the transformations. Dash in the asymptotes. Check using Desmos.* #22, 23, 24, 30	/24

4	Section 8.3: **Inverse Trig Functions** **Right Triangles, Acute Angles**	8.3 Exercises, page 686: • Concepts: 3 • Finding inverse values by hand: *DON"T use a calculator to find the answer.* *DO use your calculator to check!* *Give answers in radians and degrees.* 8, 10, 12, 15 • Solving Triangles: 22, 23 • Applications: 53, 54, 55, 57, 58	/12
5	Section 8.3: **Inverse Trig Functions Graphs, Domain and Range Restrictions,**	8.3 Exercises, page 686: • Concepts: 1, 2, 5, 7, • Finding inverse values by hand: *DON"T use a calculator to find the answer. DO use your calculator to check! Give answers in radians and degrees.* 9, 11, 13, 14, 16 • Compositions of Inverses: 33, 35 • Graphs of inverses: 50	/12
6	**Supplement on Compositions of Inverse Functions**	4 problems given in handout	/4
7	**Graphs of Combinations of Functions**	6 problems given in handout	/6

Even answers:

Section 8.1:

#2 The graph of y = sin(x) has the same features as that of y = cos(x); i.e., same amplitude, period, midline. The only difference is a phase shift (horizontal shift) of pi/2 units to the left. So y = sin(x + pi/2) would give us the same graph as y = cos(x) and y = cos(x – pi/2) would give us the same graph as y = sin(x)

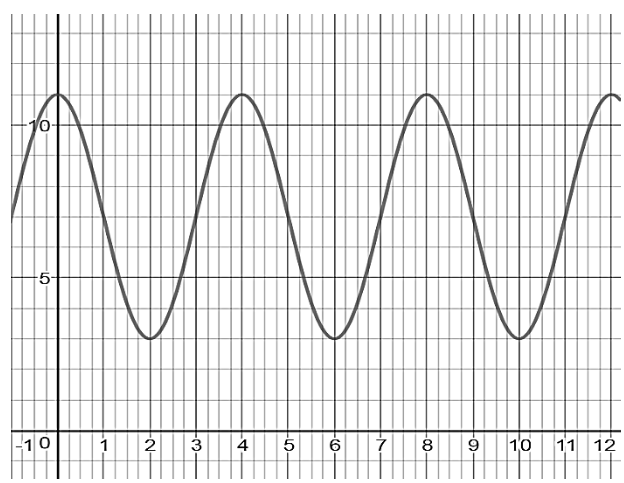
#22: $f(x) = 4\sin\left(\frac{\pi}{2}(x-3)\right)+7$

$A = 4,\ B = \frac{\pi}{2},\ x_O = 3,\ D = 7.$ The amplitude is $|4| = 4$,

so the graph is stretched. The period is $\frac{2\pi}{\frac{\pi}{2}} = 4$,

The midline is $y = 7$. There is a horizontal shift of 3 units to the right. The maximum, $y = 11$, occurs at $x = 4$ and the minimum, $y = 3$, occurs at $x = 6$.

The cosine function that is equivalent is $y = 4\cos\left(\frac{\pi}{2}x\right)+7$



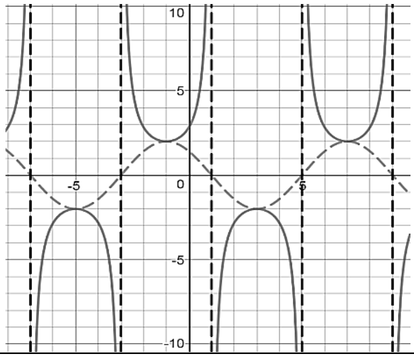
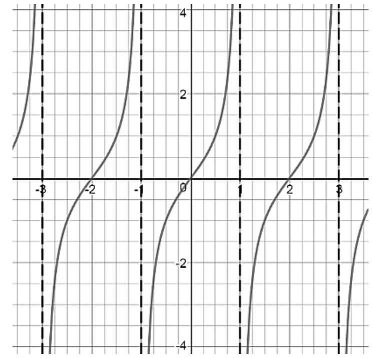
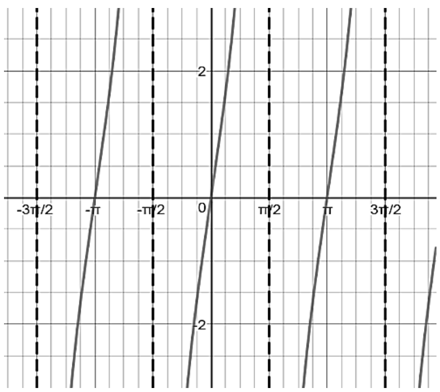
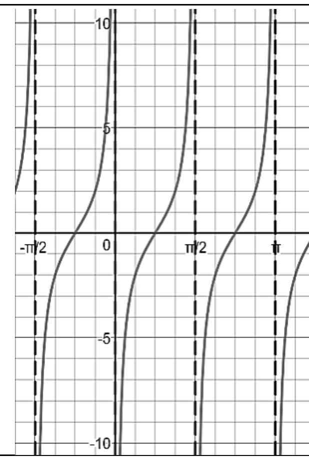
Section 8.2:

#6: f(x) = tan (x) is graph I #8: f(x) = csc(x) s graph II

#10: Period: $T = \frac{\pi}{4}$, phase shift: $x_O = 8$ (horizontal shift 8 units to the right)

#12: Period: $T = 6$, phase shift: $x_O = -3$ (horizontal shift 3 units to the left)

#14: sec(-x) = 2 #16: 4 #18: cos(x) + tan(x)sin(x)

#20 Amp = 2, T = 8, x_O = -1 (phase shift to the left 1 unit) 	#22: Period: T = 2 (all else is the same as y = tan(x)). 
#24: The graph has been stretched vertically by a factor of 4 (all else is the same as y = tan(x)) 	#30: The The graph has been reflected vertically (across the x-axis), stretched by a factor of 2, and the period has been compressed to T = pi/2 

Section 8.3:

#2: $\cos^{-1}\left(\cos\left(-\frac{\pi}{6}\right)\right) \neq -\frac{\pi}{6}$ because $-\frac{\pi}{6}$ is not in the range of $\cos^{-1}(x)$. For any negative input, x, the value of $\cos^{-1}(x)$ will be an angle in the second quadrant, most easily found by using $\cos^{-1}(-x) = \pi - \cos^{-1}(x)$

#8: pi/4 radians or 45 degrees   #10: pi/3 radians or 60 degrees

#12: pi/4 radians or 45 degrees   #14: -pi/4 radians

#16: -pi/6 radians   #22: .78 radians or 44.43 degrees (nearest hundredth = 2 decimal places)

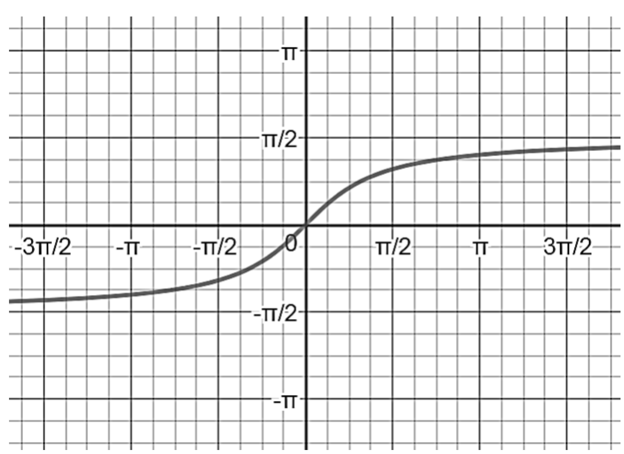
#50: Features: $\tan^{-1}(0) = 0$

Domain: all real numbers

Range: $-\frac{\pi}{2} < y < \frac{\pi}{2}$

Horizontal Asymptotes:

$y = -\frac{\pi}{2}, \quad y = \frac{\pi}{2}$



#54: The angle of elevation of the road is about 2.7 degrees

#58: The angle the line makes with the positive x-axis is 30.96 degrees)