

Explorations in Pre-Calculus 1<sup>st</sup> Semester Study Guide

\_\_\_\_\_

Name \_\_\_\_\_

Find the amplitude, period, vertical shift and phase shift.

1.  $y = 4 \sin\left(3x - \frac{\pi}{2}\right) + 1$

2.  $y = -2 \cos 2(x - 3) - 3$

1. \_\_\_\_\_

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

2. \_\_\_\_\_

3. \_\_\_\_\_

Solve for all x. Use radians and round to the nearest hundredth when needed.

4.  $4 \sin^2 x - 4 \sin x + 1 = 0$

4. \_\_\_\_\_

5.  $\cos^2 x - 1 = 0$

5. \_\_\_\_\_

6.  $\tan x = 3$

6. \_\_\_\_\_

Solve in degrees for all angles x:  $-180^\circ < x \leq 180^\circ$

7.  $\sec^2 x = 2$

7. \_\_\_\_\_

Write a sinusoidal equation with the given information.

8. Amplitude = 5, Period =  $\frac{3\pi}{4}$ , Phase shift =  $\frac{\pi}{2}$ , and a vertical shift = -2

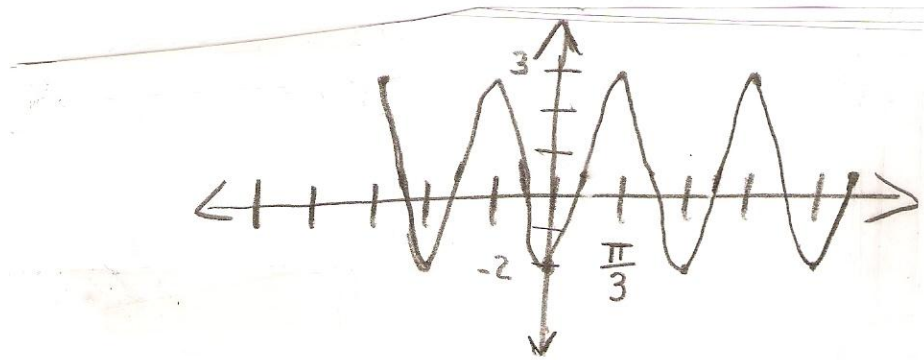
8. \_\_\_\_\_

9. A maximum of  $\left(\frac{\pi}{2}, 3\right)$ , and the next minimum of  $\left(\frac{7\pi}{4}, -1\right)$

9. \_\_\_\_\_

10. Write both a sin and cos equation.

10. \_\_\_\_\_  
 \_\_\_\_\_



11.  $\cot x = -0.5$ , and  $\frac{3\pi}{2} < x < 2\pi$ . Find the other five trig functions. Simplify all radicals and label answers.

11. \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

12. Using the answers in #11, find:

12. \_\_\_\_\_  
 \_\_\_\_\_

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

$$\cos(x + \pi)$$

Label the following sequences as either Arithmetic, Geometric, both, or neither.

13. 3, 5, 7, 9, ...

14. 1, -1, 1, -1, ...

13. \_\_\_\_\_

15.  $\frac{2}{3}, \frac{3}{4}, \frac{4}{5}, \dots$

14. \_\_\_\_\_

15. \_\_\_\_\_

Write out the terms of the following sequence.

16.  $\sum_{n=1}^6 2n+4$

16. \_\_\_\_\_

17. Write out in sigma notation.

17. \_\_\_\_\_

-5, -1, 3, 7, ...

18. Using problem 17, find  $a_{54}$  and  $S_{22}$

18. \_\_\_\_\_

\_\_\_\_\_

19. Find the sum:  $21 - 3 + \frac{3}{7} - \dots$

19. \_\_\_\_\_