FINAL – MATH 8 College Algebra and Trigonometry NAME:_____

ALGEBRA:

Simplify: Answers

1. $2^3 + 18 \div 6 \times 3 + |-9|$ _____

2. $\left(\frac{x^5}{2x^3}\right)^{-2}$

3. $\left(\frac{1}{4}x^{-2}\right)\left(-\frac{1}{3}x^4\right)$ _____

4. $(2x+5)^2$

5. $\sqrt[3]{125x^{18}y^5}$

6. $\frac{x^2+x-6}{x^2+2x-3}$ _____

7. Total income of a sales company was 4.888×10^8 dollars, there were 2.375×10^4 people working for them that year. What was the average amount each person sold?

_____

SOLVE for x:

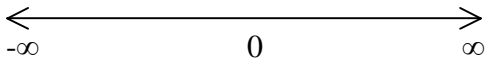
8. $\left(\frac{x-2}{4}\right)^{\frac{1}{4}} = 3$ _____

9. $5x^2 - 2x + 4 = 0$ _____

10. $|2x-3| = |3x-4|$ _____

11. Solve, write in interval notation, and graph: $5 - q > -3$ _____

interval notation _____



12. **Graph** the line $y + x = 4$ slope:_____

13. Find the center and the radius of the circle and graph: $x^2 + (y+3)^2 = 9$ center _____

radius_____

14. Graph $g(x) = -3x^2 + 6x - 3$ and give a description of any stretching/shrinking, translation, or reflections you do. You must complete the square.

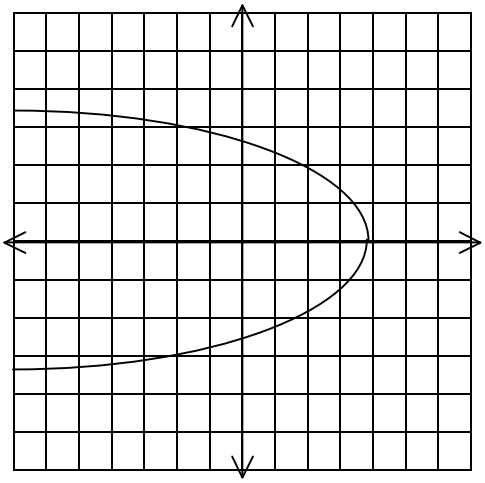
15. If a grenade is launched with a height of $h(t) = -16(t-4)^2 + 256$, where t is the time since it was launched in seconds. Graph this equation.

What is the functions vertex and is it a maximum or minimum?

What is the maximum height of the grenade?

How many seconds after the grenade is launched does it land?

16.



What is this graphs domain and range?

Is it a function?

17. $f(x)=\dfrac{13x}{2x-1}$ what are the restrictions on the domain?

18. $f(x)=\sqrt{5x-1}$ what are the restrictions on the domain?

19. Is this a function (graph if needed): $x^2=1-y$ yes no

20. $f(x)=\dfrac{1}{7}x-8$ find $f^{-1}(x)$? $f^{-1}(x)=$_____

21. Consider $f(x)=\dfrac{1}{7}x-8$ and consider $g(x)=7x^2-7$

a) f(-14) _____

b) $(f\circ g)(x)$ _____

TRIGONOMETRY

SHOW ALL WORK

22. What is the formula for converting between radians and degrees? _____

a) Convert 36° to radians (there must be a π in your answer) _____

23. Evaluate $\sin\left(\frac{4\pi}{3}\right)$ using the Unit Circle _____

24. What angle is coterminal to 15.8π ? _____

25. Use a calculator to evaluate: $3-\cos^2\left(\frac{\pi}{4}+\frac{\pi}{2}\right)$ _____

26. $y = -8\sin\left(\frac{\pi}{3}x - \frac{\pi}{6}\right) - 5$ You do **not** need to graph this.

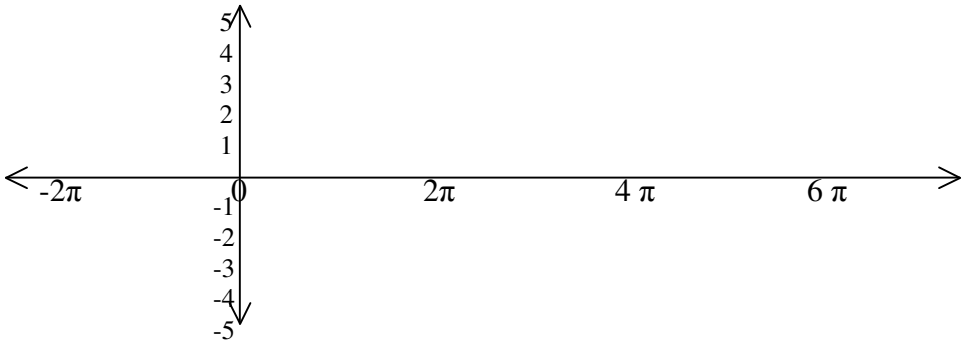
a) Period _____(1pt)

b) Frequency _____ (1pt)

c) Phase Shift _____ (1pt)

d) Amplitude _____ (1pt

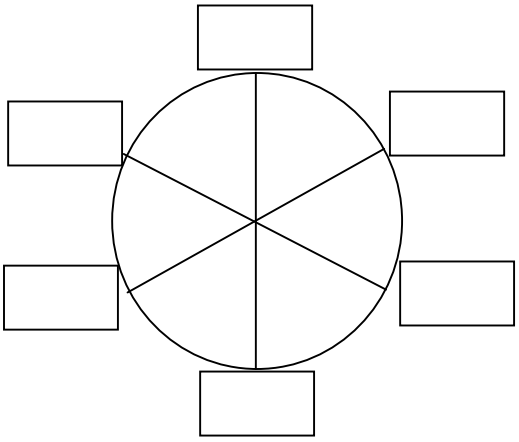
27. Graph $y = 2\cos(x - \pi)$ (3pts)



What is the range of the graph in number 7? _____

28. Using the Pythagorean identities to solve: $\sin(x) = 0.6$ what is the cos(x) ?

29. Fill in the boxes on the wheel of identities : (6pts)



30. Use the wheel to fill in the identities: (12pts)

a) $\csc x = \frac{1}{\quad}$

b) $\csc x =$ _____ × _____

c) $\csc x = \frac{\quad}{\tan x}$

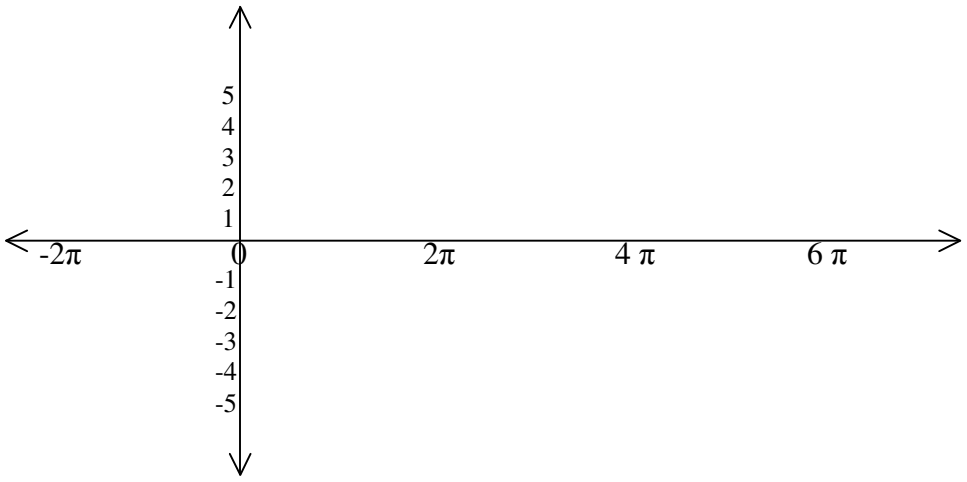
d) $\sec x \cot x =$ _____

e) $\frac{\cos x}{\cot x} =$ _____

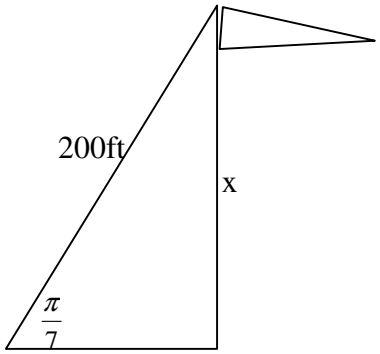
f) $\frac{1}{\sec x} =$ _____

31. What is the $\sec^{-1}(3)$ in radians? (6pts)

32. Graph the secant function remember to use reciprocal function (ie. sin or cos) as a guide (8pts)



33. I have a flag pole that is x ft tall and too high to measure and I just ran a rope to stabilize the flag pole that was 200ft long. I measure the angle to the top of the flagpole and find that it is $\frac{\pi}{7}$ radians. How many feet tall is the flagpole? (6pts)



34. Simplify $\dfrac{\sin(2y)}{1+\cos(2y)}$ _____

35. Simplify $\cos^2\left(\frac{\alpha}{2}\right)-\sin^2\left(\frac{\alpha}{2}\right)$ _____

36. Is $\cos(A-B)=\cos A\cos B-\sin A\sin B$ an identity (show all work)?

37. Prove that $-\cot(x)=\frac{1-\sin^2(x)}{\cos(-x)\sin(-x)}$ is an identity.

NEW MATERIAL 6.5-7.2

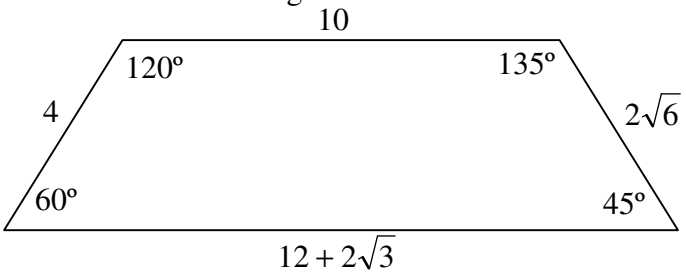
38. Use the Reduction Formula to reduce $y = 4\sin x + 4\cos x$

39. Find all values for x that satisfy the equation: $2\cos 2x + 1 = 0$

40. Solve the triangle: 7.1 Hmwk #3- $\beta = 134.2^\circ$, $a = 5.2$, $c = 13.6$

41. 7.1 Hmwk #11- Determine the number of triangles with the given parts and solve each triangle
$\gamma = 60^\circ$, $b = 20$, $c = 10\sqrt{3}$

42. 7.1 Hmwk #27 Find the area of the region



43. 7.2 Hmwk #7- solve the triangle where a=18.5, b=12.2, c=8.1

44. 7.2 #25 Use Heron's Formula to find the area of a triangle where a=16, b=9, c=10