Honors Pre Calc Summer Review Packet Name_____

This packet is due the first class period of the school and completion will be counted as a quiz grade. Be sure to review the topics from previous notes, books, or from internet sources. Take the time to re-learn any topics you are not sure of. All answers and work should go in this packet. If you need extra space, use a separate sheet of paper (write neatly and staple it to this packet). You will be assessed on material from the packet during the first two weeks of school.

Explain the meaning of each expression.

1. $f(3) = 4$

2. The zeros of a function are -3 and 5.

3. Explain why $(x+4)^2 \neq x^2 + 16$. What does it equal?

4. The slope of a line is $\frac{600\ cars}{5\ minutes}$. Explain what this means in words.

Simplify (exponents should all be positive, and radicals should be expressed with exponents)

5) $6x - [3x + 4(x-2)]$ _____

6) $(x+4)(2x-1)$ _____

7) $(3x+2)^2$ _____

8) $m^2 \cdot \sqrt{m^6} \cdot m^7$ _____

9) $(16x^2z)^0$ _____

10) $\left(\frac{x^{-3}y^4}{5}\right)^3$ _____

11) $(3\sqrt{x^3})^4$

12) $\frac{x^5y^8}{x^7y^{-4}}$

13) $\left(-\frac{125}{27}\right)^{-\frac{1}{3}}$

14) $(2x+3)(5x^2-7x+1)$

15) $\left(2\sqrt{5}+3\right)\left(\sqrt{5}-1\right)$

16) $\frac{4}{1-\sqrt{5}}$

17) $3\sqrt{12}+2\sqrt{300}$

18) $\sqrt[3]{24}$

Solve (find the value(s) of *x*)

19) $7x-4=2x-19$

20) $x^2=100$

21) $(x+3)(3x-2)=0$

22) $x^2+2x-3\leq 0$

23) $2-6x \le 8$

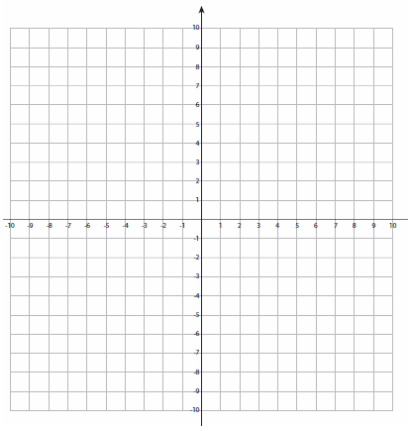
24) $2x^2 - 5x = 3$

25) $|2x+4|-3=7$

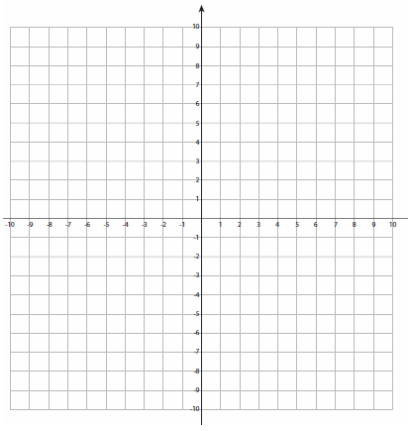
26) $\frac{x}{x-2} + \frac{1}{x-4} = \frac{2}{x^2-6x+8}$

Graph the following on the given set of axes. Make sure you label the graph.

27) $y = 3x - 2$



28) $y = x^2 + 2x - 3$



29) Define the **domain** and **range** for the problems above:

a) #27: Domain: Range:

b) #28: Domain: Range:

30) Given the equation $y = 5x + 2$ find

a) slope: ☐ b) y-intercept: ☐ c) x-intercept: ☐

d) equation of *any* parallel line ☐

e) equation of perpendicular line with the same y-intercept ☐

31) Given the equation $y = 2x^2 + 8x - 42$ find:

a) x-intercept(s) ☐ b) y-intercept ☐ c) coordinates of the vertex ☐

32) Write an equation of a vertical line ☐

33) Write an equation of a horizontal line ☐

34) Solve for *y:* $\frac{3-x}{y} = \frac{2x+1}{4y}$

35) Write the equation of a line which contains the point (5,2) and (8,11)

36 – 38 Find the equation of the line (y = mx + b) containing each pair of points:

36) The line containing the point (2, 9) and having a slope of 0.

37) The line containing (0,-2) and perpendicular to $x - 4y = 3$

38) The perpendicular bisector of the segment between (-5,3) and (12,3)

Solve the following systems using the best method (linear combination/elimination or substitution):

39) $\begin{cases} 5x + 2y = 11 \\ x + y = 4 \end{cases}$

40) $\begin{cases} 2x + y = 6 \\ 3x - 4 = y \end{cases}$

41) Solve by factoring: $4x - 3x^2 = 1$

42) Solve by using the quadratic formula: $4x - 3x^2 = 1$

43) Solve by completing the square: $4x - 3x^2 = 1$

44) Solve using synthetic division: $x^3 - 2x^2 - 29x + 30 = 0$

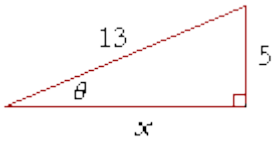
45-47 Simplify:

45) $\dfrac{x^2+8x+16}{x-1} \div \dfrac{x+4}{x^2-2x+1}$

46) $\dfrac{7}{3x+15} + \dfrac{4}{x+5}$

47) $\dfrac{9-\frac{1}{x^2}}{3+\frac{1}{x}}$

48) ***Find $\sin\theta$, $\cos\theta$, and $\tan\theta$ for the triangle shown.***



Solve the trigonometric equations where $0 \leq \theta < 2\pi$

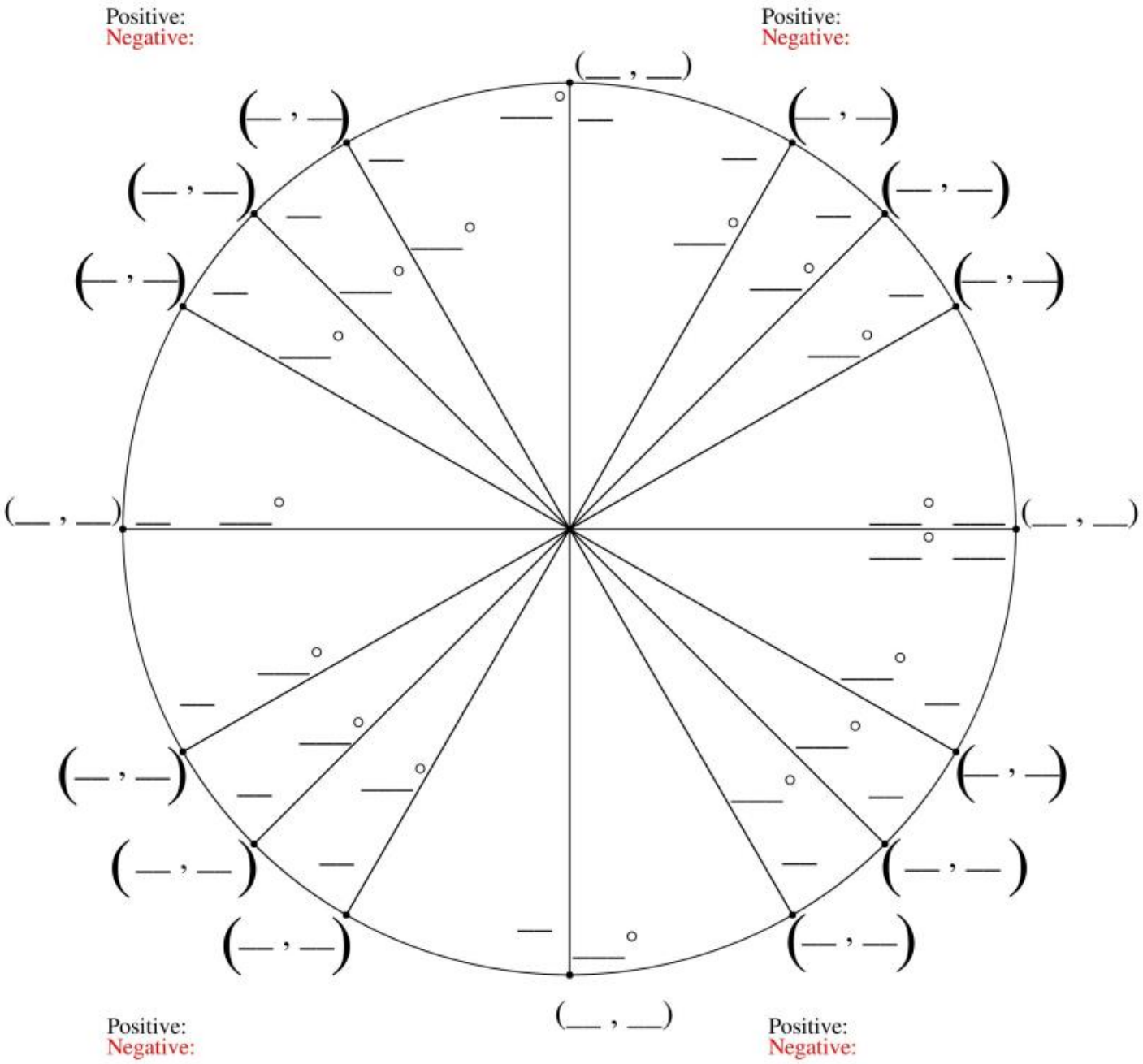
49) Complete the table below for a $30° - 60° - 90°$ triangle.

Short Leg	Long Leg	Hypotenuse
8		
	$2\sqrt{3}$	
		$6\sqrt{3}$

50) Complete the table below for a $45° - 45° - 90°$ triangle.

Leg	Leg	Hypotenuse
6		
	10	
		$4\sqrt{5}$

51) Complete the Unit Circle below:



52) Solve for A given $0 \le A < 2\pi$ (hint: some questions might have two answers)

$\cos A = \frac{1}{2}$ $\sin A = \frac{1}{2}$ $\cos A = 1$ $\tan A = \sqrt{3}$ $\sin A = \frac{\sqrt{3}}{2}$

$\tan A =$ undefined $\tan A = \sqrt{3}$ $\sec A = \frac{2\sqrt{3}}{3}$ $\cot A = \frac{\sqrt{3}}{3}$ $\sin A = 0$

53) Solve the trigonometric equations where $0 \leq \theta < 2\pi$

a) $2sin\theta cos\theta - sin\theta = 0$

b) $2\sin^2\theta + sin\theta - 1 = 0$

c) $2\sin^2\theta + 3cos\theta - 3 = 0$

54) Given $f(x) = 4x - 1 \ and \ g(x) = x^2 - 3x$, find the following:

a) $f(g(x))$

b) $g(f(x))$

c) $f^{-1}(x)$

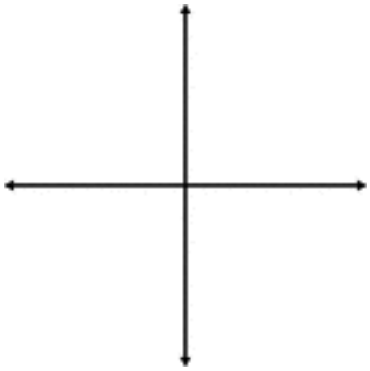
d) $(g - f)(-3)$

e) $g(a - 3)$

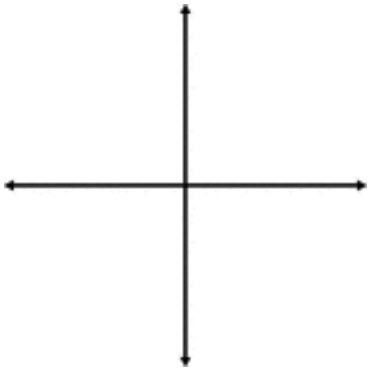
f) $\frac{g(x+h)-g(x)}{h}$

55) Parent Functions you should know. Graph each function and **clearly indicate units on the axes**.

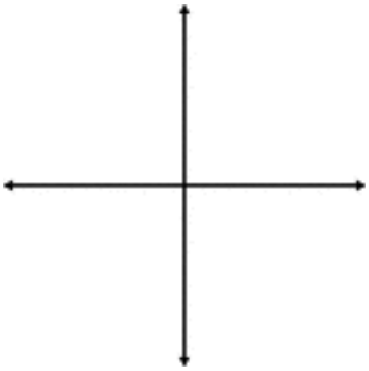
a) $f(x) = x$



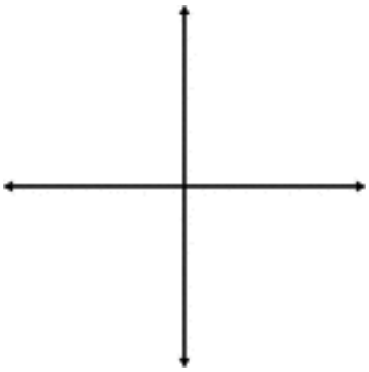
b) $f(x) = x^2$



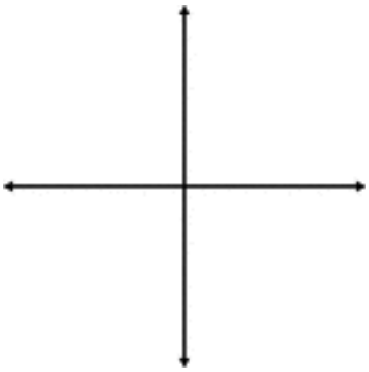
c) $f(x) = x^3$



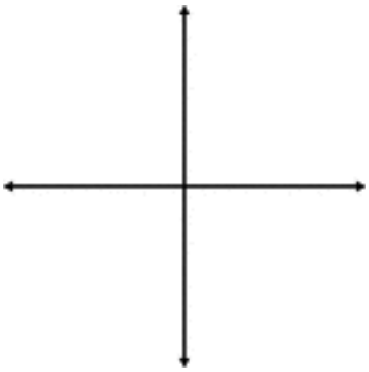
d) $f(x) = |x|$



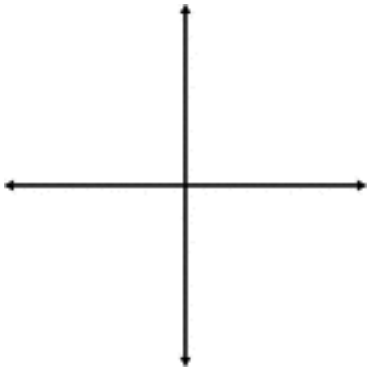
e) $f(x) = 2^x$



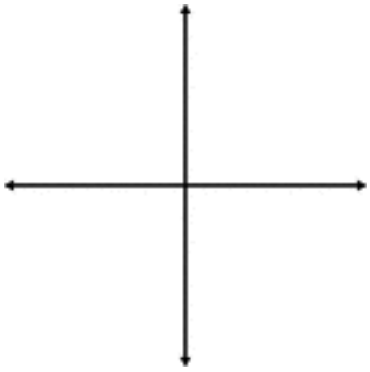
f) $f(x) = \log x$



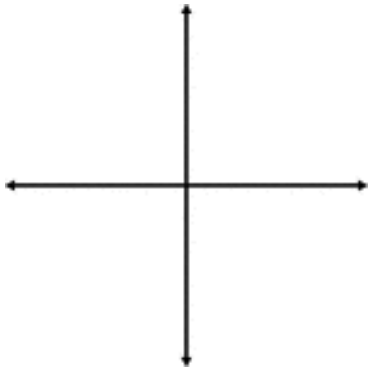
g) $f(x) = \frac{1}{x}$



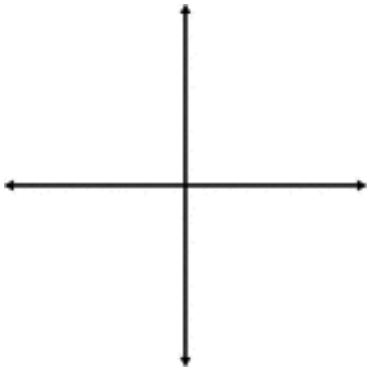
h) $f(x) = \sqrt{x}$



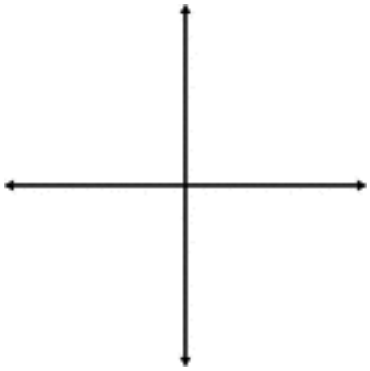
i) $f(x) = \sqrt[3]{x}$



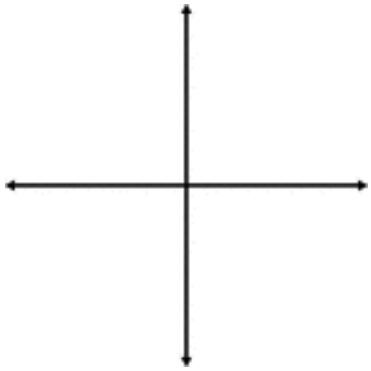
j) $f(x) = sinx$



k) $f(x) = cosx$



l) $f(x) = tanx$



56) Given the following equations, state the parent function and the transformations of the graphs from the parent functions:

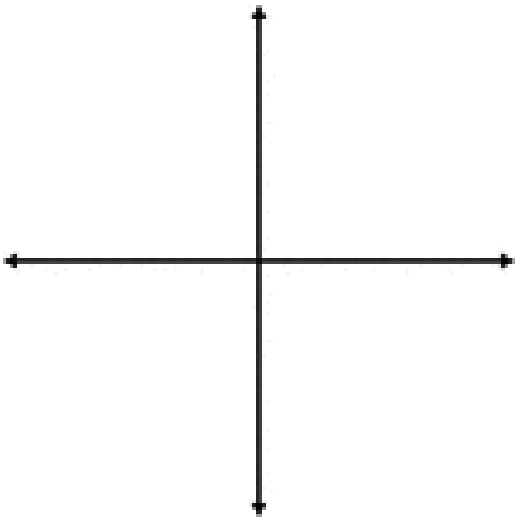
a) $g(x) = (x-2)^2 + 4$ b) $g(x) = 2\sqrt{-x-5} - 2$ c) $g(x) = -\frac{1}{3}\sin(2x-\pi) + 2$

57) Find the domain and range of the following functions:

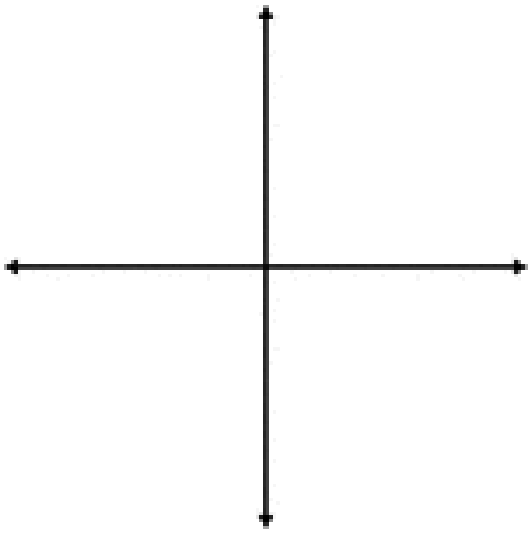
a) $f(x) = \sqrt{2x-1} + 5$ b) $g(x) = \frac{2x-3}{x+4}$ c) $h(x) = 4$

58) Graph the following functions using appropriate transformations:

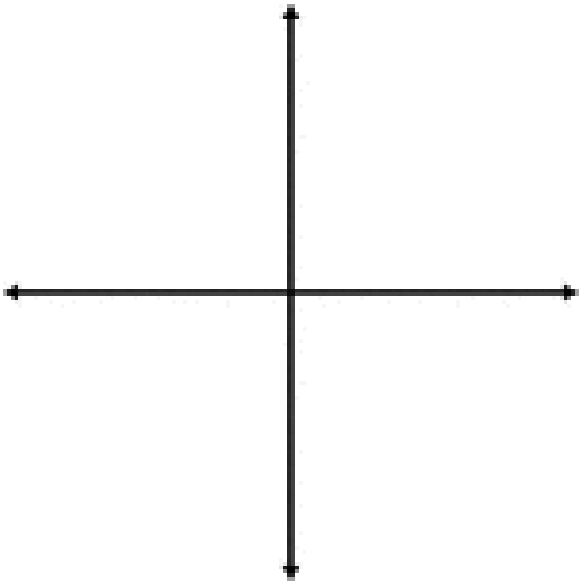
a) $y = 2\sin(3x) + 4$



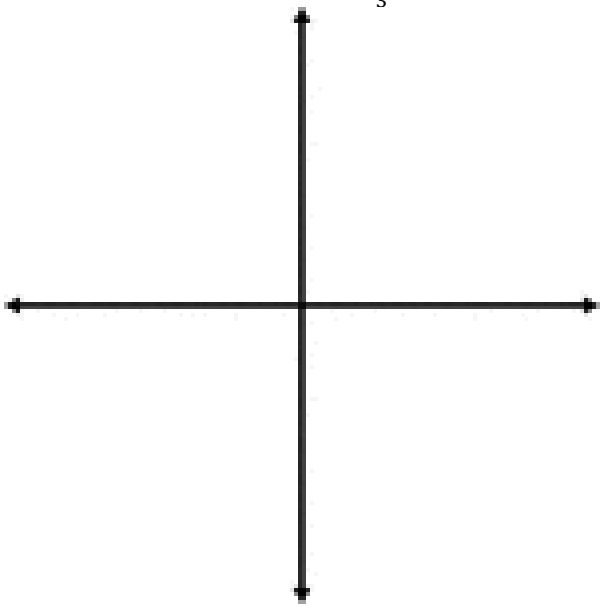
b) $y = \frac{1}{2}(x+2)^2 - 3$



b) c) $y = -e^x + 2$



d) $y = -tan\frac{1}{3}x$



59) Simplify: $\log_3 \frac{1}{27}$

60) Expand: $ln \frac{x^2}{z^3\sqrt{y}}$

61) Condense to a single logarithm: $3lne + 4lne^2 - 2lne$

62) Solve for x: $\frac{6}{1+2e^x} = 30$

63) Solve for x: $4^{3x-1} = 8^{x+4}$

64) Solve for x: $\log x + \log(4x - 9) = 2$

65) A culture of bacteria has 900 bacteria initially and 793 after 1 hour. How many will be present in the culture after 6 hours? How long before the bacteria is reduced by half?