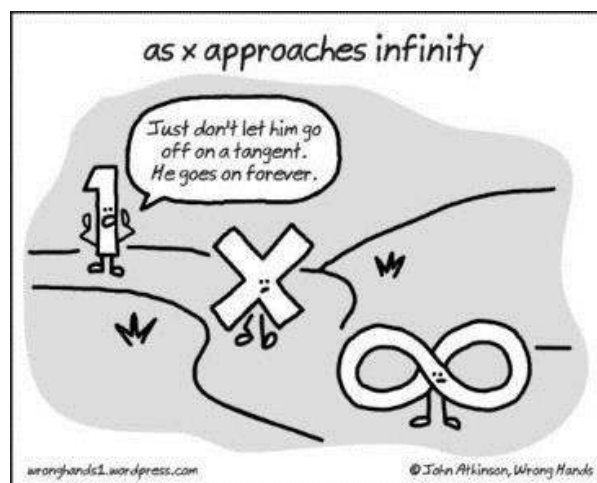


# *PreCalculus Summer Prep*



**Name:** \_\_\_\_\_



**Review Question Packet:**

This packet is for you to practice certain prerequisite skills needed for pre-calculus. It is due the **first week of school**. Several things will take place the first week of school. The packets will be graded for effort and quickly returned to you. I will answer questions in class during the first few days. You will then have a test on the packet where half the grade will come from the summer effort grade and the other half will come from your test score. For example, an effort grade of 100 plus a 70 test score will average to an 85 for your first major grade of the quarter.

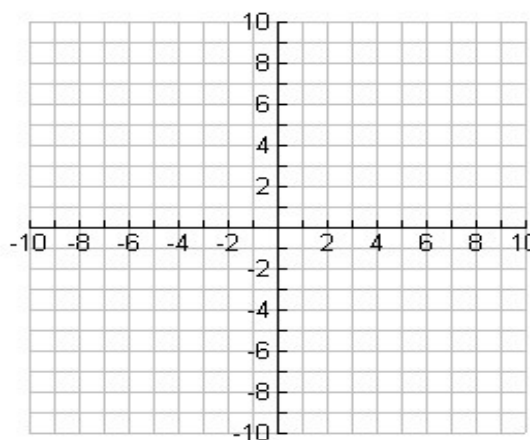
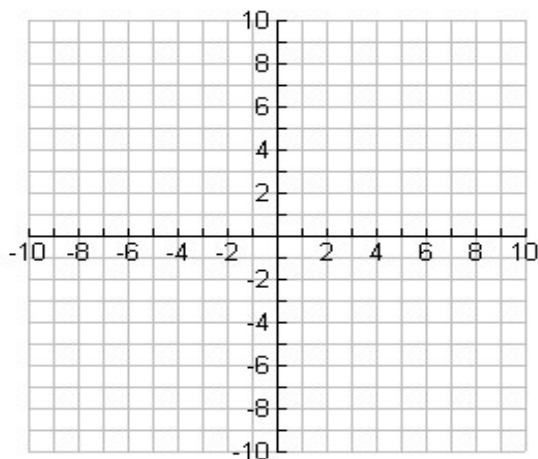
**Packet Instructions:**

- Show all answers neatly in the space provided for full credit
- If more space is needed to work a certain problem, attach separate work.
- Zero credit will be given if your work is hard for me to read due to messy or tiny handwriting.
- Box your answers
- Calculators are not allowed unless specified otherwise.
- You may work with a friend, but you may not copy their work.
- You may search the internet, but you may not use an online tutor.

**I. Geometry Topics**

**Directions – answer the following.**

1. Find the area of  $\triangle ABC$  with  $A(-5, 2)$ ,  $B(1, 6)$  and  $C(3, 2)$ .  
*Hint: graphing the points might help.*
2. Write the equation of the line parallel to the line  $4x - 6y = -1$  that intersects the function  $3x - 2y = 12$  at its  $x$ -intercept. *Hints: parallel lines have the same slope. All  $x$ -intercepts have a  $y$ -coordinate of zero.*



3. Given the distance between  $(x, 1)$  and  $(-2, 5)$  is  $2\sqrt{7}$ , find the value(s) of  $x$ . Leave your answer in simplified exact form.
4. Write an equation of the line in slope-intercept form with  $x$ -intercept of  $-3$  and a  $y$ -intercept of  $-5$ .

**II. Quadratics/Polynomials**

**Directions - Factor completely each of the following:**

5]  $4x^2 + 27x + 35$

6]  $-28y^2 + 7t^2$

7]  $x^3 - 2x^2 - 9x + 18$

8]  $8a^4 + 27ab^3$

**Directions - Solve each of the following:**

9]  $-3x^2 - 5x + 12 = 0$

10]  $3x^2 + 5x = 6$

11]  $x^2 + 2x + 3 = 0$

12]  $225 - b^2 = 0$

**III. Exponents**

**Directions - Simplify using only positive exponents.**

13]  $\left(\frac{81}{64}\right)^{-\frac{1}{2}}$

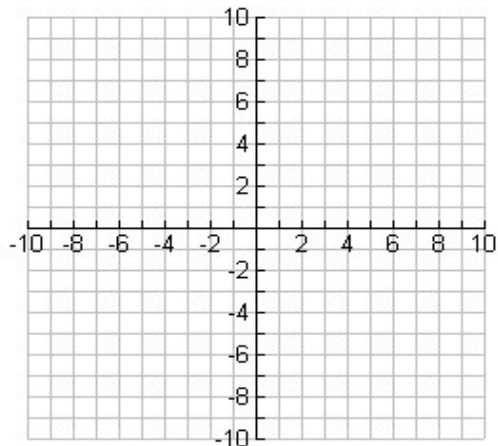
14]  $(27^{-2})^{-\frac{1}{3}}$

15]  $\frac{(3x^2)^{-1}}{6x^{-3}}$

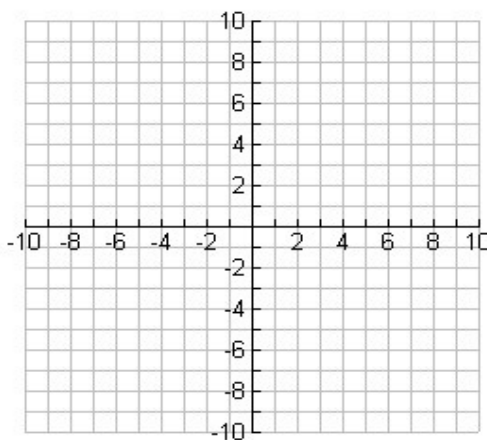
16]  $(13y)^{-1}$

**IV. Graphing:** Graph each of the following using **intercepts** and extra points as needed to sketch a nice graph

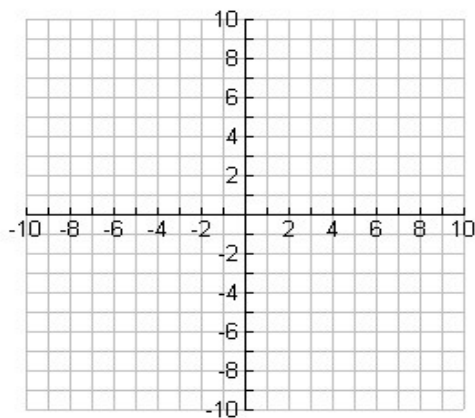
17]  $y = 2\sqrt{x+9} - 4$



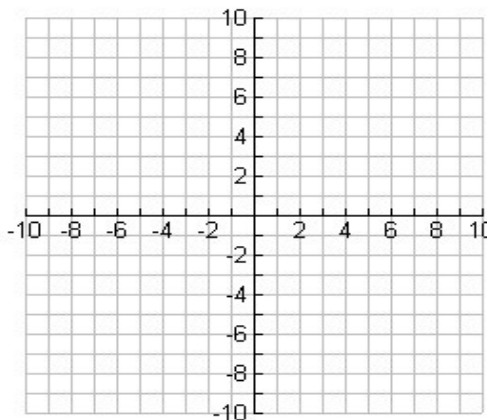
18]  $y = -\frac{1}{2}(x-4)^2 + 8$



19]  $x + 3y = -6$



20]  $y = |2x - 2| - 6$



**V. Rational Expressions:** Directions - Simplify to a single fraction or expression:

21]  $\frac{1}{ab} - \frac{2}{b^2}$

22]  $\frac{x^2 + 6x + 8}{x^2 - 4}$

23]  $\frac{-x-1}{x+1}$

24]  $\frac{3x+1}{x} - \frac{2}{x+1}$

**VI. Simplifying Radicals**

*Directions – Simplify each of the radicals, if possible.*

25]  $\sqrt{27}$

26]  $\sqrt[3]{128}$

27]  $\sqrt{\frac{45}{9}}$

28]  $\sqrt{x^2 + 64}$

29]  $\frac{10 + \sqrt{50}}{5}$

30]  $\sqrt{18} + \sqrt{8}$

**VII. Solving Rational & Radical Equations** *Solve the equations below and check for extraneous solutions.*

31]  $\frac{10}{x+4} = \frac{15}{4x+4}$

32]  $\frac{10}{x^2-2x} + \frac{4}{x} = \frac{5}{x-2}$

33]  $\sqrt{11x+3} - 2x = 0$

34]  $\sqrt{10x} - 2\sqrt{5x-25} = 0$

**VIII. Domain & Range of a Function**

*Directions: Find the Domain of the following.*

35]  $f(x) = x^2$

36]  $g(x) = -x - 9$

37]  $k(x) = \frac{x+4}{x-4}$

38]  $f(x) = |2x - 1| + 6$

39]  $y = \frac{(x-2)}{(x+2)(x-2)}$

**IX. Arithmetic Combinations of Functions & Function Composition**

For problems # 40 – 45; Given  $f(x) = 7 - x^2$  and  $g(x) = x - 4$ , evaluate the following.

40]  $f(-4)$

41]  $g(f(-4))$

42]  $f(g(-2))$

43]  $g(f(3))$

44]  $[g \circ f](5)$

45]  $f(-x)$

**X. Logarithms**

Given  $\log_b a = x$  if and only if  $b^x = a$ , where  $b > 0$ , but  $b \neq 1$  and  $a > 0$

46]  $3\log_2 x = 12$

47]  $\log_5 125 = x$

48]  $3 + 4\log_x 4 = 5$

49]  $\frac{3}{2}\log_{27}(x + 5) = 1$

**XI. Miscellaneous Problems:**

Solve the following systems of equations using any method. Show all of your work, clearly mark your answers and check your solutions.

50] 
$$\begin{cases} 2x - 3y = -9 \\ -x + 3y = 6 \end{cases}$$

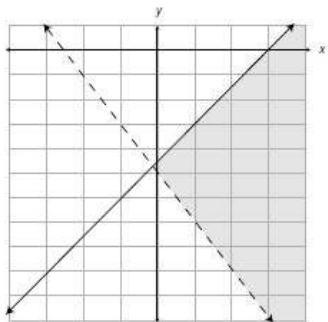
51] 
$$\begin{cases} 2x - 3y = 6 \\ x - y = 5 \end{cases}$$

52] 
$$\begin{cases} x - 3y + 3z = -4 \\ 2x + 3y - z = 15 \\ 4x - 3y - z = 19 \end{cases}$$

53] 
$$\begin{cases} 4x + 2y + 3z = 1 \\ 2x - 3y + 5z = -14 \\ 6x - y + 4z = -1 \end{cases}$$

54] Solve:  $4m - 5 > 7$  or  $4m - 5 < -9$ .

55. Write the equations for the system of inequalities graphed below.



56. Solve.  $6x^2 + 3x - 12 = 2 - 2x$

57.  $2|x + 1| - 3 \geq -9$

58] At a baseball game Sam bought 2 hamburgers and 1 order of French fries for a total of \$3.75. Erica bought 1 hamburger and 2 orders of French fries for a total of \$3.00. What is the price of one hamburger?

59] The marketing department of a company has a budget of \$30,000 for advertising. A television ad costs \$1000, a radio ad costs \$200, and a newspaper ad costs \$500. The department wants to run 60 ads per month and have as many radio ads as television and newspaper ads combined. How many of each type of ad should the department run each month?

60] Salvatore is buying fertilizer for his triangular garden. He knows the lengths of all three sides, so he is using Hero's formula to find the area. Hero's formula states that the area of a triangle is  $\sqrt{s(s-a)(s-b)(s-c)}$ , where  $a$ ,  $b$ , and  $c$  are the lengths of the sides of the triangle and  $s$  is half the perimeter of the triangle. If the lengths of the sides of Salvatore's garden are 15 feet, 17 feet, and 20 feet, what is the area of the garden?