PreCalculus
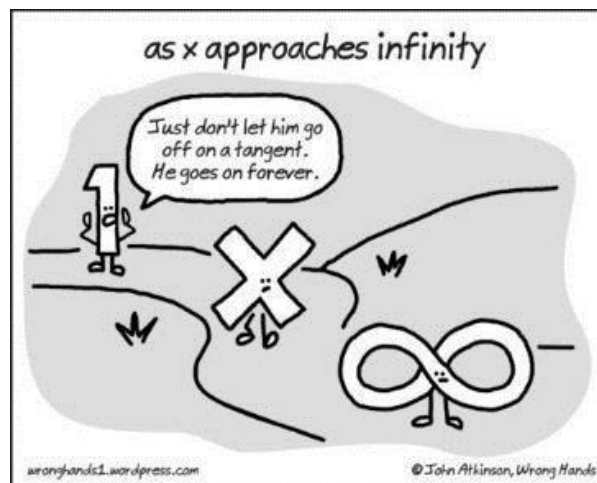*Summer Prep 2022*

*Name:*_____

Precalculus Summer Prep

Text:

The first chapter of our text will help you with the summer packet. For those who are doing Accelerated Pre-Calculus, you will need to do additional work to familiarize yourself with some topics that you may not have learned in Algebra 1 and which we will not formally cover in PreCalculus. This is the ***Bridge Work***. This will serve as your bridge to precalculus so that you will not struggle and fall behind as we move forward through the more advanced topics.

For those students who have already completed Algebra 2, you need not do the bridge work unless you have not mastered the skills covered by the bridge work. However, you will be expected to use the textbook, CK12.org, khanacademy.com or other resources to master the content covered by the Summer question packet. You will be tested on this material the first week of classes.

Bridge Work (Text) – Complete on Separate Paper, clearly organized and legible

• Appendix A.1: Radicals and Rational Exponents, p 779-782
Work through examples 1-6 and try practice exercises, p 783, Q 27-73, every other odd (11 questions)

• Appendix A.2:Polynomials and Factoring, p 784-788
Work through examples 1-11 and try practice exercises, p 789-790, 41-89 every other odd (12 questions)

• Appendix A.3: Fractional Expressions, p. 791-794
Work through examples1-7 and try practice exercises p 795 Q 33-73, every other odd (10 questions)

• Chapter 7.1 , Solving Systems of Two Equations, p. 520-524
Work through examples 1-6 and try practice exercises, p 526-529, Q 3-26, all odd.

Recommended Resources:

http://www.khanacademy.com

http://www.purplemath.com/modules/index.htm

http://www.hippocampus.org/?select-textbook=19

http://tutorial.math.lamar.edu/Classes/Alg/Alg.aspx

http://coolmath.com

http://www.ck12.org (open an account if you do not have one since we will be using this site throughout the year)

You can also consult your Algebra 2 and/or Geometry textbooks from past courses for concepts you may not remember.

Learning to navigate through various math sites and sources will help you considerably in PreCalculus and in other math classes you may take in future. As you advance in your math studies, you will be required to do more independent investigation and problem solving. This summer packet can help move you toward this goal.
Have a great summer and I will see you in the fall.

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 ΔABC 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.*
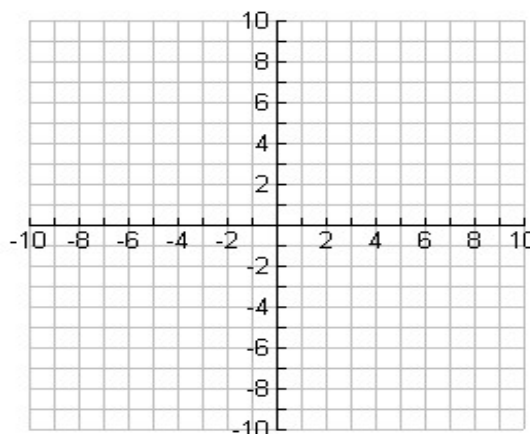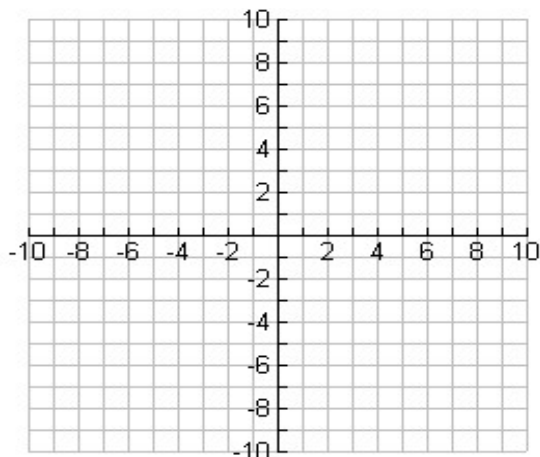
3. Given the distance between $(x,1)$ and $(-2,5)$ is $2\sqrt{7}$, find the value(s) of x. Leave your answer in simplified exact form.

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.
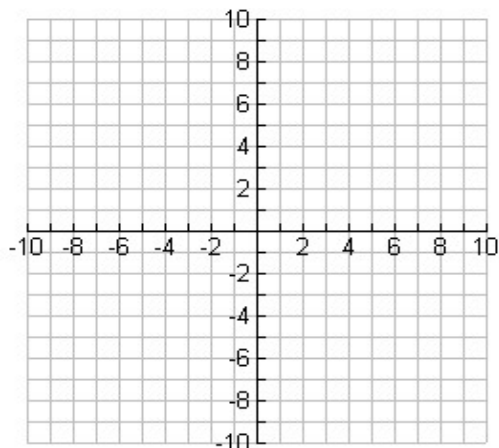
13] $\left(\dfrac{81}{64}\right)^{-2}$

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

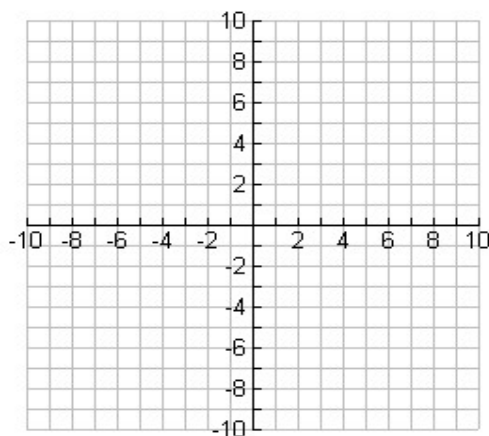15] $\dfrac{\left(3x^2\right)^{-1}}{6x^{-3}}$

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

IV. <u>*Graphing:*</u> *Graph each of the following using <u>**intercepts**</u> and extra points as needed to sketch a nice graph*
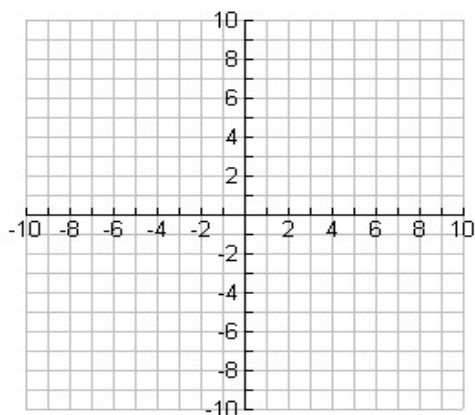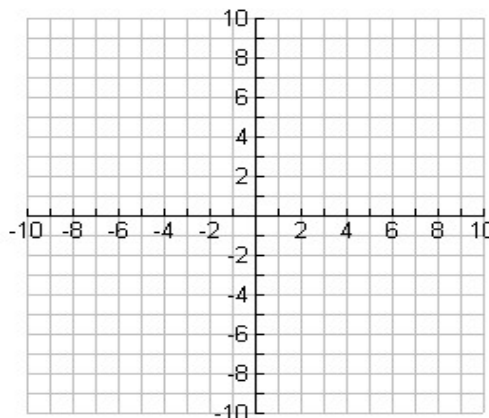
17] $y = 2\sqrt{x+9} - 4$

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

19] $x + 3y = -6$

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

V. <u>*Rational Expressions:*</u> *Directions - Simplify to a single fraction or expression:*

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

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

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

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

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

25] $\sqrt{27}$

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

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

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

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

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

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

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

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

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

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

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

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

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] $\begin{cases} 2x - 3y = 6 \\ x - y = 5 \end{cases}$
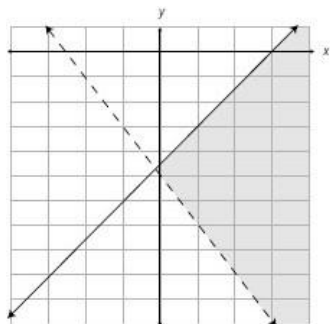
52] $\begin{cases} x - 3y + 3z = -4 \\ 2x + 3y - z = 15 \\ 4x - 3y - z = 19 \end{cases}$

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?