Hey Future Algebra 2 with Trigonometry Honors Students!!

I know it's hard to think about next year, but I wanted to give you some information for next year's math course that you will be taking.

Expectations:

1. Make sure you have a graphing calculator (TI-84 Plus) by the beginning of the school year. Please make every effort to have the calculator in your hands from day one, as we will be using it DAILY.

2. You must work on the following algebra review packet and have it completed by the 1st day of school. The reason for this is that there are topics we will expect you to be proficient in as we move forward. There will not be time in the course to iron out algebra issues. You are expected to know your algebra and this is our way of helping you to "remember" your awesome skills. The answers to the problems are attached so that you can check your work. THERE WILL BE A 50 POINT QUEST ON THIS MATERIAL THE FIRST WEEK OF SCHOOL. WE WILL ANSWERS ANY QUESTIONS YOU MIGHT HAVE SO DON'T WAIT UNTIL THE FIRST DAY OF SCHOOL TO DO THE PACKET!!!

3. Our goal is to make next year a rewarding and successful experience in Algebra 2 with Trigonometry Honors (Formerly ICA H). We have high expectations and hope you're up for the challenge. It's a great class and you will learn a lot!!

4. Most importantly, finish this year with a bang and have a great summer. Try to make time for mathematics and do lots of reading. Your brain needs exercise too!!

5. Below, you will find a variety of websites you may want to visit over the summer to refresh your memory about the topics discussed in this packet.

   Khan Academy: khanacademy.org/#browse
   Bright Storm: brightstorm.com
   Math Forum at Drexel University: mathforum.org/dr.math
   Purple Math: purplemath.com/
   Math is Fun?: mathisfun.com/
   Cut the Knot: cut-the-knot.org/algebra.shtml
   Cool Math: coolmath.com/algebra/algebra1/index.html

Ms. Behnke and Ms. Markley

Algebra 2 with Trig Honors Review Packet   Name:_____

GROUP 1 Problems:

I. Write each statement as an inequality and graph on the number line:

1. x is positive

2. x is greater than or equal to 2

3. x is less than 5 and greater than 2

4. x is less than -2 or greater than 8

II. Find the value of each expression if x = 2 and y = -8

1. $|x + y|$

2. $|x| + |y|$

3. $|x| - |y|$

4. $-|y|$

III. Simplify each expression so that all exponents are positive:

Ex: $x^{-4}y^5 = \dfrac{y^5}{x^4}$ Ex: $x^0 = 1$ (Any nonzero number to the zero power is 1)

1. $x^{-1}y^4$

2. $x^4 y^0$

3. $\dfrac{x^5}{x^2}$

4. $(xy)^{-2}$

5. $\dfrac{x^{-3}y^5}{xy^4}$

6. $6x^4 + 7x^4$

7. $6x^4(7x^4)$

8. $\dfrac{x^{-1}y^{-2}z}{x^2 yz^3}$

9. $\left(\dfrac{4x}{5y}\right)^{-2}$

10. $\dfrac{2^3 3^2}{2^1 3^{-2}}$

11. $(-3)^2$

12. -3^2

13. $(6x^3)(2x^2)$

GROUP 2 Problems:

Ex: $9^{\frac{1}{2}} = \sqrt{9} = 3$ Ex: $9^{\frac{3}{2}} = \left(\sqrt{9}\right)^3 = 27$

So $x^{\frac{1}{n}} = \sqrt[n]{x}$; What is $27^{\frac{1}{3}}$? It means $\sqrt[3]{27} = 3$!!!

I. Simplify: Try these problems without a calculator:

1. 4^{-2} 2. $\left(\dfrac{2}{3}\right)^2$ 3. $25^{\frac{1}{2}}$ 4. $(-27)^{\frac{1}{3}}$ 5. $(-27)^{\frac{1}{2}}$

6. $\sqrt{-16}$ 7. $\sqrt{16}$ 8. $16^{\frac{1}{2}}$ 9. $16^{-\frac{1}{2}}$ 10. $64^{\frac{2}{3}}$

11. $64^{\frac{3}{2}}$ 12. $\sqrt[3]{\dfrac{-8}{27}}$

II. Simplify:

1. $\left(10x^5 - 8x^2\right) + \left(3x^3 - 2x^2 + 6\right)$ 2. $(2x-1)(x+2)$

3. $(x+8)(2x-1)$ 4. $\left(5x^3 - 2x^2 + 12x\right) - \left(-2x^3 - 3x^2 + 6x\right)$

5. $-2(5x-8) + 3(x+12)$ 6. $\dfrac{1}{3}(6x-2) + \dfrac{1}{5}(10x-8)$

GROUP 3 Problems:
I. Simplify radicals:

1. $\sqrt{12}$ 2. $5\sqrt{16}$ 3. $\dfrac{1}{\sqrt{5}}$ 4. $\dfrac{-2}{\sqrt{3}}$ 5. $\dfrac{-\sqrt{3}}{\sqrt{5}}$

6. $\left(\sqrt{3} + \sqrt{2}\right)\left(\sqrt{2} - \sqrt{3}\right)$ 7. $\dfrac{2}{3 + \sqrt{2}}$ 8. $\dfrac{2 - \sqrt{5}}{2 + 3\sqrt{5}}$

9. $\dfrac{\sqrt{2}}{\sqrt{7}+2}$

10. $\left(5\sqrt{8}\right)\left(-3\sqrt{3}\right)$

11. $\left(3\sqrt{6}\right)\left(2\sqrt{2}\right)$

12. $\left(\sqrt{x}-1\right)^2$

13. $\left(\sqrt{x}+\sqrt{5}\right)^2$

14. $\sqrt{27x^3}$

15. $\sqrt[5]{x^{10}y^5}$

GROUP 4 Problems:

I. Solving Equations:

1. $6-x=2x+9$

2. $-3(x-5)=-14$

3. $3-2x=2-x$

4. $5-(2x-1)=10$

5. $1-\dfrac{1}{2}x=5$

6. $\dfrac{x}{4}=\dfrac{-2}{7}$

7. $\dfrac{4}{y}-5=\dfrac{5}{2y}$

8. $\dfrac{1}{2}x-4=\dfrac{3}{4}x$

9. $-7(x-2)-(3x+2)=12$

II. Let's solve some quadratic equations! (Solve by factoring, using radicals or you might need to KNOW the quadratic formula)

1. $x^2=25$

2. $x^2-8x=0$

3. $x^2-x-12=0$

4. $2x^2+5x-12=0$

5. $x^2-5x=-3$

6. $4x^3-8x^2=0$

GROUP 5 Problems:

I. Evaluate:

1. If $f(x)=3x-4$, find $f(5)$

2. If $f(x)=x^2-3x$, find $f(-2)$

3. If $f(x)=-5x+2$, find x when $f(x)=-3$

4. If $f(x)=6x^2+3x-2$, find $f(a)$

II. Lines

1. Find the slope of a line passing through (-2 , 6) and (10 , 8)

2. If a line has a zero slope, then the line is _____.

3. If a line has undefined slope, then the line is _____.

4. Write the equation of a line whose slope is -4 and whose y-intercept is 16.

5. Write the equation of a line passing through (3 , -4) and (2 , 1)

6. Write the equation of the line whose slope is -2 and passing through (3 , -1)

7. Find the y-intercept of the line $4x - 9y = 27$

8. What is the intersection of the lines $y = -3$ and $x = 6$?

9. Write the equation of the line passing through (6 , 4) and (-12 , 4)

10. Sketch the graph of $y = -2x + 4$
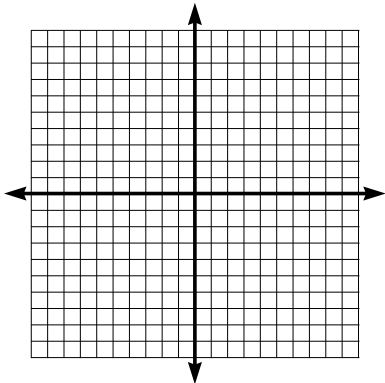
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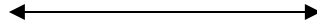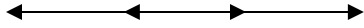
GROUP 1 Solutions:

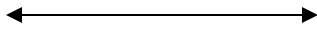I.
1. $x > 0$ 2. $x \geq 2$ 3. $2 < x < 5$

4. $x < -2$ or $x > 8$

II.
1. 6   2. 10   3. -6   4. -8

III.
1. $\dfrac{y^4}{x}$ 2. x^4 3. x^3 4. $\dfrac{1}{x^2 y^2}$ 5. $\dfrac{y}{x^4}$

6. $13x^4$ 7. $42x^8$ 8. $\dfrac{1}{x^3 y^3 z^2}$ 9. $\dfrac{25y^2}{16x^2}$ 10. $2^2 3^4 = 324$

11. 9   12. -9   13. $12x^5$

GROUP 2 Solutions:
I.
1. $\dfrac{1}{4^2} = \dfrac{1}{16}$ 2. $\dfrac{4}{9}$ 3. $\sqrt{25} = 5$ 4. $\sqrt[3]{-27} = -3$

5. No Real Solutions   6. No Real Solutions   7. 4   8. $\sqrt{16} = 4$

9. $\dfrac{1}{\sqrt{16}} = \dfrac{1}{4}$ 10. $\left(\sqrt[3]{64}\right)^2 = 4^2 = 16$ 11. $\left(\sqrt{64}\right)^3 = 512$ 12. $\dfrac{-2}{3}$

II.
1. $10x^5 + 3x^3 - 10x^2 + 6$ 2. $2x^2 + 3x - 2$ 3. $2x^2 + 15x - 8$

4. $7x^3 + x^2 + 6x$ 5. $-7x + 52$ 6. $4x - \dfrac{34}{15}$

GROUP 3 Solutions
I.

1. $2\sqrt{3}$ 2. 20 3. $\dfrac{1}{\sqrt{5}} \cdot \dfrac{\sqrt{5}}{\sqrt{5}} = \dfrac{\sqrt{5}}{5}$ 4. $\dfrac{-2}{\sqrt{3}} \cdot \dfrac{\sqrt{3}}{\sqrt{3}} = \dfrac{-2\sqrt{3}}{3}$

5. $\dfrac{-\sqrt{3}}{\sqrt{5}} \cdot \dfrac{\sqrt{5}}{\sqrt{5}} = \dfrac{-\sqrt{15}}{5}$ 6. $\sqrt{6} - 3 + 2 - \sqrt{6} = -1$ 7. $\dfrac{2}{3+\sqrt{2}} \cdot \dfrac{3-\sqrt{2}}{3-\sqrt{2}} = \dfrac{6-2\sqrt{2}}{7}$

8. $\dfrac{2-\sqrt{5}}{2+3\sqrt{5}} \cdot \dfrac{2-3\sqrt{5}}{2-3\sqrt{5}} = \dfrac{4-6\sqrt{5}-2\sqrt{5}+15}{4-45} = \dfrac{19-8\sqrt{5}}{-41}$

9. $\dfrac{\sqrt{2}}{\sqrt{7}+2} \cdot \dfrac{\sqrt{7}-2}{\sqrt{7}-2} = \dfrac{\sqrt{14}-2\sqrt{2}}{3}$ 10. $-15\sqrt{24} = -15\left(2\sqrt{6}\right) = -30\sqrt{6}$

11. $6\sqrt{12} = 6\left(2\sqrt{3}\right) = 12\sqrt{3}$ 12. $\left(\sqrt{x}-1\right)\left(\sqrt{x}-1\right) = x - 2\sqrt{x} + 1$

13. $\left(\sqrt{x}+\sqrt{5}\right)^2 = x + 2\sqrt{5x} + 5$ 14. $3x\sqrt{3x}$ 15. $x^2 y$

GROUP 4 Solutions:
I.

1. $x = -1$ 2. $x = \dfrac{29}{3}$ 3. $x = 1$ 4. $x = -2$

5. $x = -8$ 6. $x = \dfrac{-8}{7}$ 7. $x = \dfrac{3}{10}$ 8. $x = -16$

9. $x = 0$

II.

1. $x = \pm 5$ 2. $x = 0, 8$ 3. $x = 4, -3$ 4. $x = \dfrac{3}{2}, -4$

5. $x = \dfrac{5 \pm \sqrt{13}}{2}$ 6. $x = 0, 2$

GROUP 5 Solutions:

1. $f(5) = 3(5) - 4 = 11$

2. $f(-2) = (-2)^2 - 3(-2) = 4 + 6 = 10$

3. $\begin{aligned} -3 &= -5x + 2 \\ -5 &= -5x \\ 1 &= x \end{aligned}$

4. $f(a) = 6a^2 + 3a - 2$

II.

1. $\dfrac{8-6}{10-(-2)} = \dfrac{2}{12} = \dfrac{1}{6}$

2. Horizontal

3. Vertical

4. $y = -4x + 16$

5. $m = \dfrac{1+4}{2-3} = -5$

   $y + 4 = -5(x - 3)$ Point-Slope form

   $y - 1 = -5(x - 2)$ Point-Slope form

   $y = -5x + 11$ Slope-Intercept form

6. $y + 1 = -2(x - 3)$ or $y = -2x + 5$

7. $(0, -3)$

8. $(6, -3)$

9. $y = 4$ (Horizontal Line)

10.