

## Clearview Regional High School District 2017 Summer Assignment Coversheet

Course	Honors Pre-Calculus
Mathematics Supervisor	Ms. Mary Marks
Due Date	Friday, September 8 <sup>th</sup>
Grade Category/Weight for Q1	Students will take a quiz on the material in the packet. The quiz will tentatively be scheduled for Tuesday, September 12 <sup>th</sup> , after opportunity has been provided in class to go over questions that students may have.
Common Core and/or NJ Core Curriculum Content Standards covered	<u>Algebra</u> : Expressions (A-SSE 1, 2, 3), Operations with Monomials and Polynomials (A-APR 1, 3, 6), Equations (A-CED 1, 2, 3), and Reasoning (A-REI 1, 2, 3, 4, 5, 6, 10) <u>Functions</u> : Interpreting (F-IF 1, 2, 4, 6, 7, 8), Building (F-BF 1), Linear and Quadratic Models (F-LE 2)
Description of Assignment	Algebra Review Packet in preparation for Honors Pre-Calculus
Purpose of Assignment	The purpose of Honors Pre-Calculus is to prepare students for a college-level Calculus course. The skills contained in this packet are prerequisite skills that they should know from their previous math courses. If they find they are deficient in any of these skills, they may want to seek additional practice prior to the start of school.
Specific Expectations	The packet should be completed prior to the start of school. Solutions should be checked once they are posted in August. Students should practice with skills that they find they are deficient in prior to the start of school and mark any questions that they have for the teacher. Time will be allotted in class for questions about problems in the packet, but not for the complete re-teaching of the skills in the packet.
Where to Locate Assignment	District Website
Helpful Resource(s)	<u>Khan Academy</u> : <a href="https://www.khanacademy.org/">https://www.khanacademy.org/</a>

IXL.com: (20 problems per day can be practiced for free)

<http://www.ixl.com/>

The Virtual Mathlab:

<http://www.wtamu.edu/academic/anns/mps/math/mathlab/>

Math.com:

<http://www.math.com/homeworkhelp/Algebra.html>

SOS Mathematics:

<http://www.sosmath.com/index.html>

Algebra Help:

<http://www.algebrahelp.com>



The purpose of Honors Pre-Calculus is to prepare you for a college-level Calculus course. The skills contained in this packet are prerequisite skills that you should know from your previous math courses. If you find you are deficient in any of these skills, you may want to seek additional practice prior to the start of school. You will be quizzed on the material in this packet the first week of school. I will be available to answer questions prior to the quiz the first few days of school. **Solutions will be posted the last Monday in August.**

**I look forward to meeting you in September!**

**FOIL PRACTICE:** (*First, Outside, Inside, Last*)

1.  $(x^2 + 3)(x - 7)$

2.  $(x - 4)(x^2 + 3x - 5)$

3.  $(-2x^3 + 1)(x - 3)$

4.  $(5x - 6)(-x + \frac{1}{2})$

5.  $(\sqrt{2} + x)(\sqrt{8} - x)$

## FACTORING PRACTICE

Factor each.

1.  $y^2 - 12y + 20$

2.  $16x^2 - 25y^2$

3.  $12z^2 - z - 6$

4.  $18p^3 - 51p^2 - 135p$

5.  $36a^3b^2 + 66a^2b^3 - 210ab^4$

## RATIONALIZING RADICALS

Simplify.

1.  $\frac{3\sqrt{3}}{\sqrt{2}}$

2.  $\frac{1}{\sqrt{5}}$

3.  $\frac{12}{3\sqrt{2}}$

4.  $\frac{3}{2 + \sqrt{5}}$

5.  $\frac{xy}{\sqrt{x}}$

## SOLVING SYSTEMS OF EQUATIONS

Solve by using the substitution method.

$$\begin{aligned} 1.) \quad & 2x + y = 4 \\ & 3x + 2y = 1 \end{aligned}$$

$$\begin{aligned} 2.) \quad & y = 3x - 27 \\ & y = \frac{1}{2}x - 7 \end{aligned}$$

Solve by using the elimination method.

$$\begin{aligned} 3.) \quad & 3u + 5v = -12 \\ & 2u - 3v = -8 \end{aligned}$$

$$\begin{aligned} 4.) \quad & 2a - b = 8 \\ & 6a - 3b = -9 \end{aligned}$$

## SIMPLIFYING SQUARE ROOTS

$$1.) \sqrt{124}$$

$$2.) 135^{1/3}$$

$$3.) \sqrt{20x^2}$$

$$4.) \sqrt{12} \cdot \sqrt{48}$$

$$5.) \sqrt{32} + \sqrt{54} - \sqrt{98}$$

## LINEAR EQUATIONS

### Standard Form

Put the following equations into standard form.

1.  $3y - 5 = 0$

2.  $y = \frac{2}{3}x + 1$

3.  $4x + 3y = 12$

4.  $3(x + 2) - 7(y - 4) = 2x$

### Slope-Intercept

Find the slope-intercept form of an equation of the line that has a slope of \_\_\_\_\_ and passes through \_\_\_\_\_.

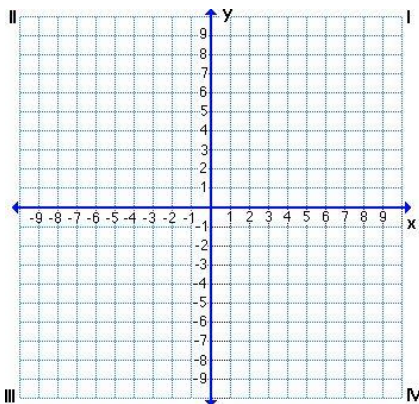
5. slope  $-\frac{1}{2}$ , passes through  $(2, -3)$

6. slope 4, passes through the origin

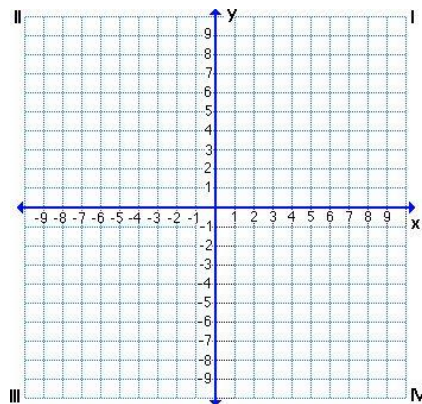
## GRAPHING EQUATIONS

Graph the following equations.

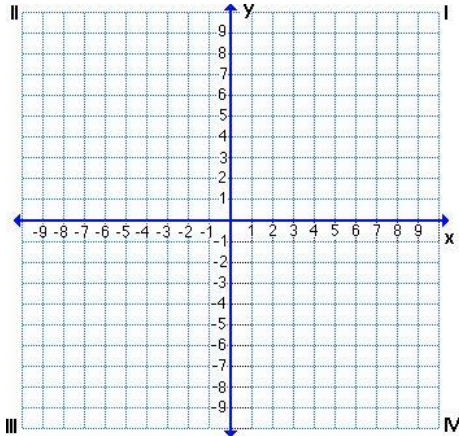
7.  $2x + 5y = 10$



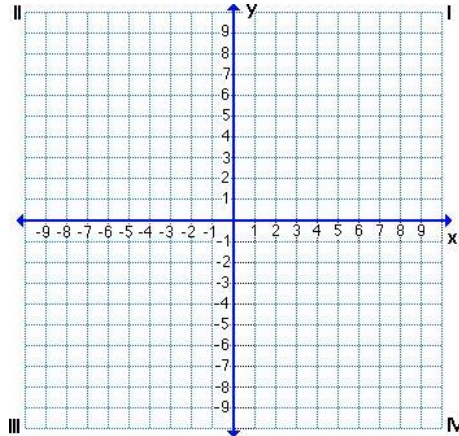
8.  $\frac{x}{4} - \frac{y}{3} = 2$



9.  $4y = 16 + 2x$



10.  $5x + 6y = 4x - 2$



### **PARALLEL AND PERPENDICULAR LINES**

Write an equation in slope-intercept form of the line that passes through \_\_\_\_\_ and is perpendicular to the line whose equation is \_\_\_\_\_.

11. passes through  $(-9,5)$ , equation  $y = -3x + 2$

12. passes through  $(4,6)$ , equation  $y = \frac{2}{3}x + \frac{10}{3}$

## SOLVING LINEAR EQUATIONS

Solve for x in each equation:

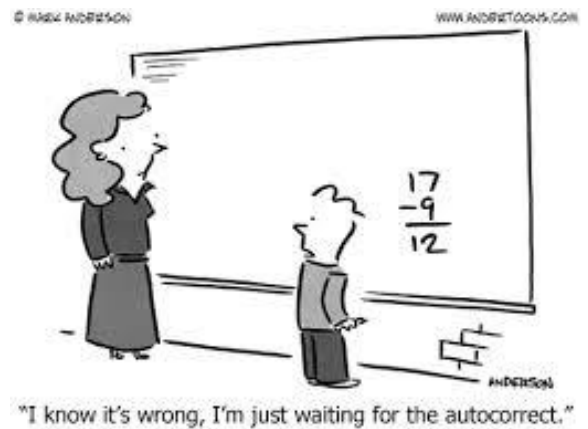
a.  $3(2x - 5) - 1 = -2(x + 4)$

b.  $\frac{4x+2}{3} = 5x - 1$

c.  $\frac{t+x-p}{m} = y$

d.  $2x - 12y = 10$

e.  $\frac{3}{2}x - 3 = \frac{3}{4}$





# QUADRATIC EQUATIONS

## Standard Form

Put the following equations into standard form.

1.  $f(x) = 2(x - 1)^2 - 5$

2.  $f(x) = -(x + 2)^2 + 3$

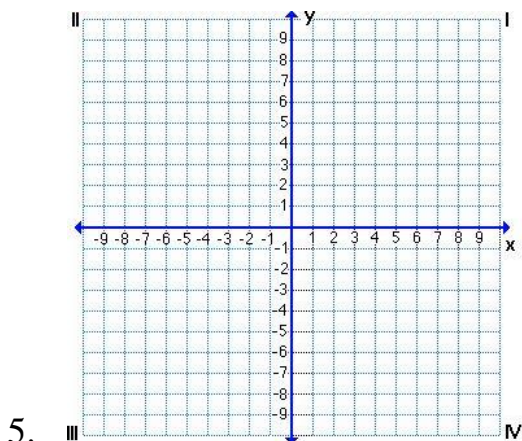
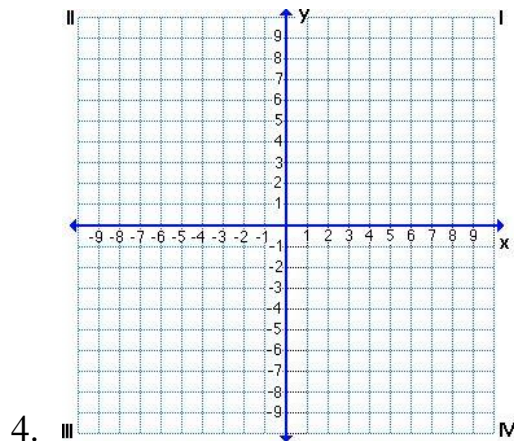
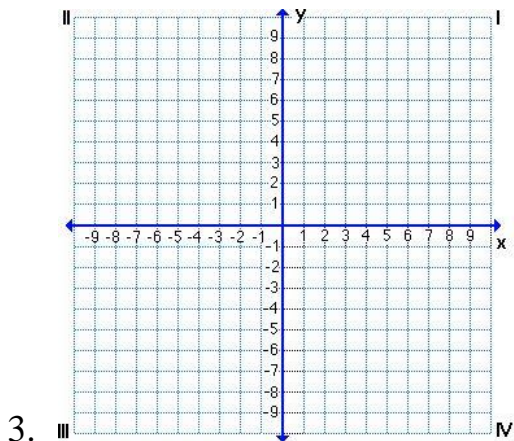
## Graphing Quadratics

Identify the vertex, axis of symmetry, direction of opening, and y-intercept for each quadratic equation given and then graph below.

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

4.  $f(x) = (x - 3)^2 - 4$

5.  $f(x) = -x^2 + 5$



## SOLVING QUADRATIC EQUATIONS

Remember that quadratic functions can be solved in a variety of ways, by graphing, factoring, completing the square, and the quadratic formula. You must be comfortable determining the most appropriate method and solving.

Solve the following.

1.  $16x^2 = 25$

2.  $x^2 - 10x + 25 = 0$

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

4.  $2x^2 + x - 28 = 0$

5.  $12x^2 - 11x = 5$

6.  $2x^2 + 7x - 1 = 0$

## MANIPULATING RADICALS

Simplify the following. Express in radical form.

1)  $\sqrt[4]{b^4}$

2)  $\sqrt{50 a^3 b^7 c^2}$

3)  $\sqrt[3]{8 b^2 z^3}$

4)  $\sqrt[3]{64 a^6 b^9}$

5)  $\sqrt{\frac{b^3}{a^4}}$

6)  $\sqrt{a} \cdot \sqrt[3]{b} \cdot \sqrt[4]{c}$

## EXPONENT RULES

$$(a^m)^n = a^{mn}$$

$$\frac{a^n}{a^m} = a^{n-m}$$

$$(ab)^n = a^n b^n$$

$$\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$$

$$a^{-n} = \frac{1}{a^n}$$

$$a^{\frac{m}{n}} = \sqrt[n]{a^m} \text{ or } (\sqrt[n]{a})^m$$

You are expected to know the above rules. Use them to simplify the following. Answers may not be expressed with negative exponents!

$$1) \frac{2x^2 y^4 t^7}{6x^7 y^5 t}$$

$$2) \frac{m^{-4} p^3 k^{-1}}{p^{-2} k^{-2} m^{-2}}$$

$$3) \frac{1}{2x^{-3}} \cdot 4x^{\frac{1}{2}}$$

$$4) \frac{3 x^{\frac{4}{5}} y^2}{6 x^{\frac{1}{3}} y^2}$$

$$5) \frac{20x^{20} t^{-\frac{1}{3}}}{10x^{10} t^{-4}}$$

$$6) \frac{3 x p^{-3}}{6 x^3 p^{-2}}$$

## DISTANCE AND MIDPOINT

**You are expected to have the distance and midpoint formulas memorized from Algebra 2.**

A rectangle has vertices located at  $A(2,1)$ ,  $B(10,1)$ ,  $C(10,16)$ , and  $D(2,16)$ .

- A. What is the horizontal width of the rectangle from A to B?
- B. What is the length of the diagonal AC?
- C. What are the coordinates of the point midway between A and D?
- D. What are the coordinates of the intersection of diagonals AC and BD?
- E. What is the slope of diagonal BD?
- F. What is the slope of a line perpendicular to diagonal AC?

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"It's important to learn math because someday you might accidentally buy a phone without a calculator."

**A significant portion of this course will be calculator-free. You may want to brush up on basic arithmetic without the use of a calculator.**

## FRACTIONS

Complete without a calculator. Leave all answers as simplified fractions.

a.  $\frac{2}{3} + \frac{3}{4} + \frac{5}{6}$

b.  $\frac{2x}{3} + \frac{3x}{8}$

c.  $\frac{4}{3} \times 9 \times \frac{3}{4} \times \frac{8}{9}$

d.  $\frac{35q^8}{9p^5} \div \frac{25q^6}{10p^5}$

e.  $\left(\frac{mt}{p}\right)\left(\frac{pt}{m}\right)$

f.  $\frac{x}{x-2} + \frac{-8}{x^2-4}$

## OPERATIONS

Simplify #1-16 **without** the use of a calculator.

1.  $45 - [3(5-3)]$

2.  $(9^2 + 4 \cdot 9 \div 4 - 6) \div 3$

3. Find the value of  $2X^2 + 3X - 4$  when  $X = -3$

Subtract:

4.  $-21 - (-0.8)$

5.  $-0.8 - (-1.1)$

6.  $\frac{15}{16} - \frac{7}{20}$

7.  $(+13) - (-2)$

Multiply:

8.  $0.35 \times 0.3$

9.  $\frac{10}{33} \cdot \frac{9}{50}$

10.  $-5.2 \cdot (-12.8)$

11.  $1\frac{1}{5} \cdot 4\frac{1}{2}$

12.  $7.3 \cdot (-12.1)$

Divide

13.  $-21.07 \div -4.3$

14.  $0.27 \div 0.1$

15.  $5\frac{1}{3} \div 3\frac{1}{5}$

16. Add:  $\frac{3}{10} + \frac{1}{4}$

See you in September!

