

Dear Parent and Student,

This summer packet is meant for students to practice the skills needed to be successful in Honors Geometry.

-Students are expected to attempt all the problems and attempt them without a calculator. This packet will **NOT** count as a grade, however, there will be a quiz given in September, so this packet will be very helpful. Any questions please contact Mrs. Kelly through Classroom posted below or Mrs. Puitz by email listed below.

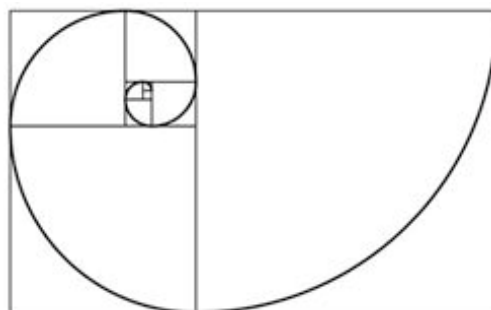
-Detailed solutions and explanations to the summer packet will be posted on the Clearview website in August and also for 8<sup>th</sup> graders on classroom "Summer 2021 Honors Geometry".

8<sup>th</sup> GRADERS only . . . .  
Sign up for Summer 2021 Honors GEOMETRY  
Classroom code **xmdvppa**

Highschool students . . . .  
[Tpuitz@clearviewregional.edu](mailto:Tpuitz@clearviewregional.edu)

Enjoy the summer!

-Clearview Regional School District Mathematics Department



## A. MULTIPLYING POLYNOMIALS

1]  $(x^3 + 3)(x - 7)$

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

3]  $(5x - 6)(-x + \frac{1}{2})$

4]  $(\sqrt{2} + x)(\sqrt{8} - x)$

## B. FACTOR EACH OF THE EXPRESSIONS

5]  $y^2 - 12y + 20$

6]  $z^2 - z - 6$

7]  $4ax^2 + 16ax + 16a$

8]  $2x^2 + 17x + 21$

9]  $6x^2 - 11x - 10$

10]  $k^2 - 64w^2$

**C. RATIONALIZE EACH RADICAL EXPRESSION**

11]  $\frac{3\sqrt{3}}{\sqrt{2}}$

12]  $\frac{1}{\sqrt{5}}$

13]  $\frac{12}{3\sqrt{2}}$

14]  $\frac{xy}{\sqrt{x}}$

**D. SOLVE EACH SYSTEM OF EQUATIONS USING SUBSTITUTION.**

15]  $\begin{cases} 2x + y = 4 \\ 3x + y = 1 \end{cases}$

16]  $\begin{cases} y = 3x - 27 \\ y = \frac{1}{2}x - 7 \end{cases}$

**E. SOLVE EACH SYSTEM OF EQUATIONS USING ELIMINATION**

$$17] \begin{cases} 3k + 5g = -12 \\ 2k - 3g = -8 \end{cases}$$

$$18] \begin{cases} 2k - g = 8 \\ 6k - 3g = -9 \end{cases}$$

**F. SIMPLIFY EACH RADICAL EXPRESSION**

$$19] \sqrt{124}$$

$$20] \sqrt{215}$$

$$21] \sqrt{20x^2}$$

$$22] \sqrt{12} \cdot \sqrt{48}$$

$$23] \sqrt{32} + \sqrt{54} - \sqrt{98}$$

**G. EVALUATE EACH OF THE EXPRESSIONS WITHOUT THE USE OF A CALCULATOR**

24]  $45 - [3(5 - 3)]$

25]  $(9^2 + 4 \cdot 9 \div 4 - 6) \div 3$

26] What does  $2x^2 + 3x - 4$  equal when  $x = -3$ ?

27]  $-21 - (-0.8)$

28]  $-0.8 - (-1.1)$

29]  $\frac{15}{16} - \frac{7}{20}$

30]  $13 - (-2)$

31]  $(1\frac{1}{5})(4\frac{1}{2})$

32]  $(7.3)(-12.1)$

33]  $-21.07 \div (-4.3)$

34]  $(5\frac{1}{3}) \div (3\frac{1}{5})$

35]  $\frac{3}{10} + \frac{1}{4}$

36]  $\frac{10}{33} \cdot \frac{9}{50}$

37]  $0.35 \times 0.3$

**H. SOLVE EACH LINEAR EQUATION BELOW FOR 'X'**

38]  $3(2x - 5) - 1 = -2(x + 4)$

39]  $\frac{4x + 2}{3} = 5x - 1$

40]  $\frac{t + x - p}{m} = y$

41]  $2x - 12y = 10$

42]  $\frac{3}{2}x - 3 = \frac{3}{4}$

**I. EVALUATE EACH EXPRESSION WITHOUT A CALCULATOR. LEAVE ALL FINAL ANSWERS IN *SIMPLEST* FORM.**

43]  $\frac{2}{3} + \frac{3}{4} + \frac{5}{6}$

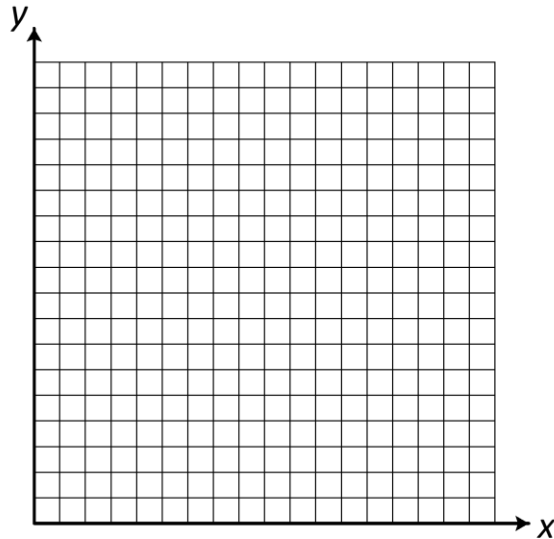
44]  $\frac{2x}{3} + \frac{3x}{8}$

45]  $\left(\frac{4}{3} \times 9\right) \div \left(\frac{3}{4} \times \frac{8}{9}\right)$

46]  $\left(\frac{mt}{p}\right) \left(\frac{pt}{m}\right)$

**J. USE THE DISTANCE AND MIDPOINT FORMULAS TO ANSWER THE FOLLOWING QUESTIONS**

A rectangle has vertices located at A(13,1) B(3,1) C(3,15) and D(13,15)  
Graph the rectangle on the grid provided.



47] What is the length of the rectangle from A to B? from B to C?

48] What is the length of a diagonal from A to C?

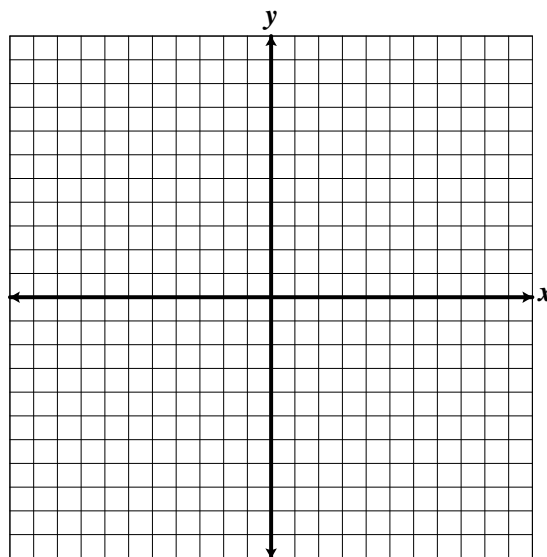
49] What are the coordinates of the midpoint between A and C?

50] What is the slope of . . .

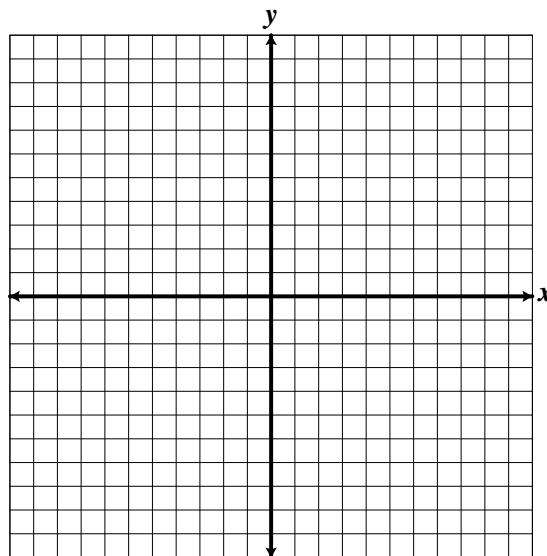
- Line AB?
- Line BC?
- A line perpendicular to diagonal  $\overline{AC}$ ?

**K. GRAPH EACH LINEAR EQUATION ON THE COORDINATE PLANES PROVIDED.**

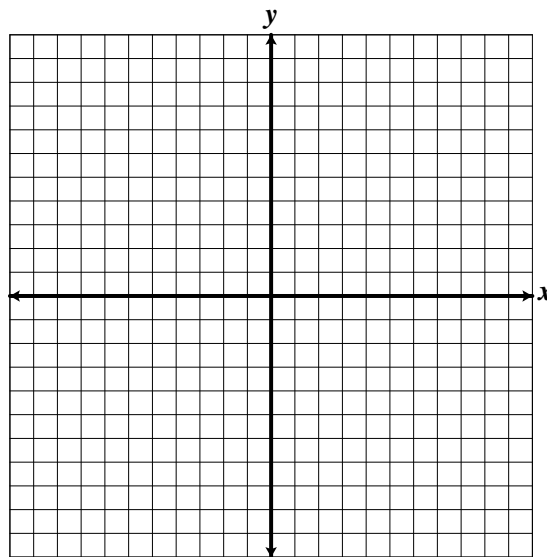
51]  $4y = 16 + 2x$



52]  $2x + 5y = 10$



53]  $\frac{x}{4} - \frac{y}{3} = 2$





**L. WRITE THE EQUATION OF THE LINE FROM THE GIVEN INFORMATION.**

54] Write an equation in slope-intercept form of the line that passes through (2,5) and has slope = -3.

55] Write an equation in slope-intercept form of the line passing through (0,1) and is perpendicular to the line  $2x + 4 = y$ .

56] Write an equation in slope-intercept form of the line passing through (4,6) and is parallel to the line  $y = \frac{2}{3}x + \frac{10}{3}$ .

57] Write an equation in slope-intercept form of the line passing through (-9,5) and is perpendicular to the line  $y = -3x + 2$ .

**M. FOR #58-60 DETERMINE IF THE PAIR OF LINES ARE PARALLEL, PERPENDICULAR, OR NEITHER.**

$$\begin{aligned} 58] \quad & y = 2x + 5 \\ & y = -2x + 4 \end{aligned}$$

$$\begin{aligned} 59] \quad & 2y + 3x = 5 \\ & 3y = 2x - 7 \end{aligned}$$

$$\begin{aligned} 60] \quad & x = 3y + 2 \\ & y = \frac{1}{3}x - 3 \end{aligned}$$

**N. FOR EACH PROBLEM BELOW, THE SLOPE OF A LINE IS GIVEN. DETERMINE THE SLOPE OF THE PERPENDICULAR LINE.**

$$61] \quad m = 3/5$$

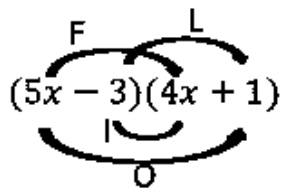
$$62] \quad m = -6$$

$$63] \quad m = -1/11$$

$$64] \quad m = -\sqrt{2}$$

**SOME HINTS:** These are just a few hints, please utilize online resources for help if necessary.

## A) MULTIPLYING POLYNOMIALS BY THE FOIL METHOD:



$$\begin{array}{cccc} 20x^2 & + & 5x & - & 12x & - & 3 \\ \text{F} & & \text{O} & & \text{I} & & \text{L} \end{array}$$

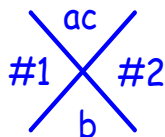
$$20x^2 - 7x - 3$$

## B) FACTORING

Steps for Factoring a QUADRATIC Equation

$$ax^2 + bx + c$$

- 1) Factor out GCF (if possible)
- 2) Set up the **Magic X**
  - ac goes on top, b goes on the bottom
  - find the pair that multiplies to the top and adds to the bottom
- 3) Set up the **Magic T**
  - put ax on the top two and the pair we found for the bottom two
  - treat each side as a fraction and reduce
- 4) you now have your factors



Example →

$$(3)(10) = 30$$

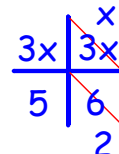
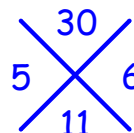
$$(5)(6) = 30$$

$$5 + 6 = 11$$

$$3x^2 + 11x + 10$$

$$\text{GCF} = 1$$

$$= (3x + 5)(x + 2)$$



- 1) Factor out GCF
- 2) Magic X
  - What pair multiplies to equal top and adds to bottom?
- 3) Magic T
  - Reduce
- 4) You have your factors

## C) RATIONALIZE THE DENOMINATOR

- 1) Multiply the "top" and bottom by the square root in the denominator.
- 2) Simplify the numerator if necessary. The denominator will become the square root of a perfect square.
- 3) Reduce the fraction if necessary.

$$\begin{array}{c} \frac{5}{\sqrt{10}} = \frac{5}{\sqrt{10}} \cdot \frac{\sqrt{10}}{\sqrt{10}} = \frac{5\sqrt{10}}{\sqrt{100}} = \frac{5\sqrt{10}}{10} = \frac{\sqrt{10}}{2} \end{array}$$

Reduce:  $\frac{5}{10} = \frac{1}{2}$

## F) SIMPLIFYING RADICALS

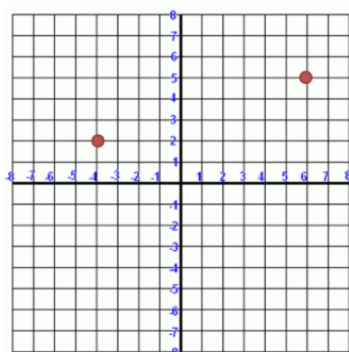
$$\sqrt{98} = \sqrt{7 \cdot 7 \cdot 2} = 7\sqrt{2}$$

This is just 7

## J) DISTANCE AND MIDPOINT FORMULA

### Distance Formula

used to find the length of a segment



Point A:  $(-4, 2)$

Point B:  $(6, 5)$

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$d = \sqrt{(6 - (-4))^2 + (5 - 2)^2}$$

$$d = \sqrt{(10)^2 + (3)^2}$$

$$d = \sqrt{100 + 9}$$

$$d = \sqrt{109}$$

$$d = 10.44$$

### Midpoint Formula

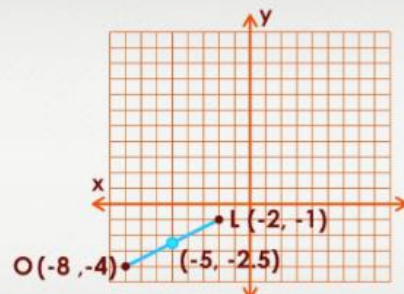
used to find the exact center between 2 points

Midpoint formula

$$\left( \frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$= \left( \frac{-8 + -2}{2}, \frac{-4 + -1}{2} \right)$$

$$= (-5, -2.5)$$



## K) GRAPHING LINEAR EQUATIONS

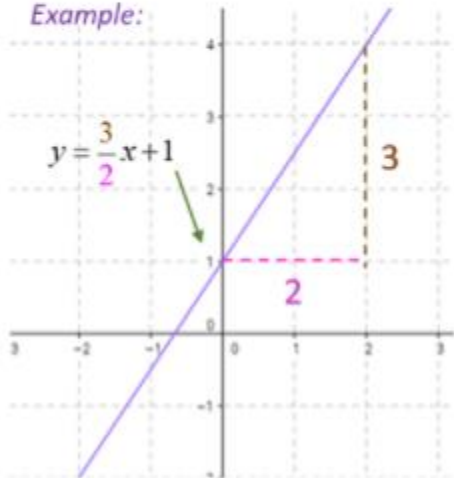
### Slope-Intercept Form

$$y = mx + b$$

slope of line

y intercept, where the line crosses the y-axis at  $(0, b)$

Example:



## L) WRITE AN EQUATION OF A LINE

### Write an Equation in

### Slope-Intercept Form

A line passing through  $(2, 2)$  and  $(3, 4)$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{4 - 2}{3 - 2} = 2$$

$$y = mx + b$$

$$4 = 2(3) + b$$

$$4 = 6 + b$$

$$-2 = b$$

$$y = mx + b$$

$$y = 2x - 2$$

Find the equation of a line Through  $(1, 10)$  and Perpendicular to  $2x - y = 2$

$$2x - y = 2$$

$$y = 2x - 2$$

$$L_1 \text{ Slope} \cdot L_2 \text{ Slope} = -1$$

$$2 \cdot L_2 \text{ Slope} = -1$$

$$L_2 \text{ Slope} = -\frac{1}{2}$$

$$y = mx + b$$

$$y = -\frac{1}{2}x + b$$

$$y = -\frac{1}{2}x + b \quad (1, 10)$$

$$10 = -\frac{1}{2}(1) + b$$

$$b = \frac{21}{2}$$

$$y = -\frac{1}{2}x + \frac{21}{2}$$