



FAIRFIELD
PUBLIC SCHOOLS

Summer Packet for students entering Geometry

Welcome to Geometry. Geometry is a fundamental course that will include an extension of the algebra skills learned in Algebra 1. You are expected to have a strong background in the skills reviewed in this packet. Resource links are embedded within each section throughout the packet. This packet will be checked for completion and entered as a formative Infinite Campus grade.

DUE: 1st week of school.

Need help on some of the topics? For each section a link to an instructional video has been provided!

Note:

Questions #1-16 are for all students taking Geometry

Questions #17-22 are only for students taking Honors Geometry

Have a great summer and see you in the fall! 😊

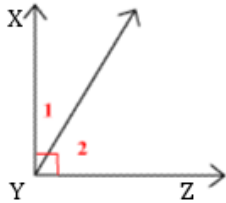
GEOMETRY BASIC SKILLS:

ANGLES: use facts about supplementary, complementary, acute, right and obtuse angles to determine angles and solve simple equations for an unknown angle in a figure.

Complementary and Supplementary Angles: <https://www.khanacademy.org/math/geometry-home/geometry-angles/geometry-vert-comp-supp/v/complementary-and-supplementary-angles?modal=1>

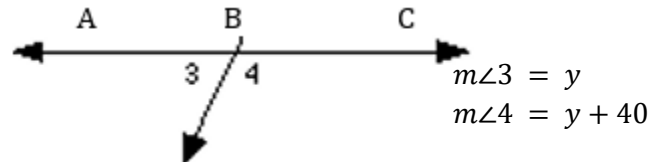
1. Given the information below, write an equation and solve the equation to determine the missing angle lengths.

a.



$$\begin{aligned} m\angle 1 &= x \\ m\angle 2 &= 2x \end{aligned}$$

b.



$$\begin{aligned} m\angle 3 &= y \\ m\angle 4 &= y + 40 \end{aligned}$$

If $m\angle XYZ = 90^\circ$ it is called a _____ angle. If $m\angle ABC = 180^\circ$ it is called a _____ angle.

Equation: _____

Equation: _____

$$m\angle 1 = \underline{\hspace{2cm}}$$

$$m\angle 3 = \underline{\hspace{2cm}}$$

$$m\angle 2 = \underline{\hspace{2cm}}$$

$$m\angle 4 = \underline{\hspace{2cm}}$$

$\angle 1$ and $\angle 2$ are a pair of:

$\angle 3$ and $\angle 4$ are a pair of:

Complementary / supplementary angles.

Complementary / supplementary angles.

Ratios, Proportions and Fractions: understand the concepts of ratio and proportions and use this relationship to solve real-world and mathematical problems by reasoning about tables, equivalent ratios or equations.

Ratios and Proportions: <https://www.khanacademy.org/test-prep/praxis-math/praxis-math-lessons/praxis-math-number-and-quantity/a/gtp--praxis-math--article--ratios-and-proportions--lesson>

Solving Proportions: <https://www.khanacademy.org/math/cc-seventh-grade-math/cc-7th-ratio-proportion/cc-7th-write-and-solve-proportions/v/find-an-unknown-in-a-proportion>

2. For each of the following, perform the given operation and simplify.

a. $\frac{1}{3} + \frac{1}{4}$

b. $\frac{2}{3} \left(\frac{5}{8} \right)$

c. $\frac{1}{2} \div \frac{3}{4}$

3. Tell whether the following ratios form a proportion. Explain your reasoning.

a. $\frac{2}{7}, \frac{4}{21}$

b. $\frac{3}{10}, \frac{15}{50}$

4. Solve for x : $\frac{12}{5} = \frac{x}{4}$

5. Solve for x : $\frac{2}{3} = \frac{x+7}{3x}$

6. Solve for x : $\frac{2x+3}{5} = \frac{x-1}{3}$

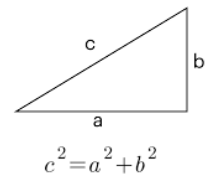
$x =$ _____

$x =$ _____

$x =$ _____

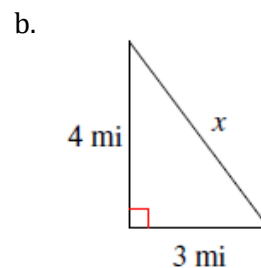
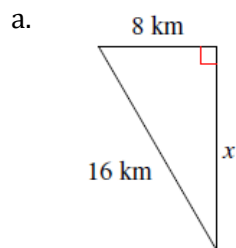
PYTHAGOREAN THEOREM: apply the Pythagorean Theorem to determine unknown side lengths in right triangles.

Pythagorean Theorem: <https://www.khanacademy.org/math/cc-eighth-grade-math/cc-8th-geometry/cc-8th-pythagorean-theorem/v/the-pythagorean-theorem>



Simplifying Square Roots: <https://www.khanacademy.org/math/algebra/x2f8bb11595b61c86:rational-exponents-radicals/x2f8bb11595b61c86:simplifying-square-roots/v/simplifying-square-roots-1>

7. Find the length of the missing side in each diagram. Leave your answer in simplest radical form or round your answers to the nearest hundredth



8. Simplify. Leave your answer in simplest radical form.

a. $\sqrt{20}$

b. $\sqrt{45}$

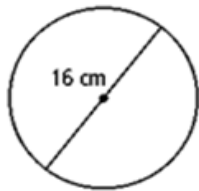
c. $\sqrt{6} \cdot \sqrt{12}$

CIRCUMFERENCE and AREA: know and apply the circumference and area formulas for circle and use them to solve problems.

Area and Circumference of a Circle: <https://www.khanacademy.org/math/cc-seventh-grade-math/cc-7th-geometry/cc-7th-area-circumference/v/circles-radius-diameter-and-circumference>

<https://www.khanacademy.org/math/cc-seventh-grade-math/cc-7th-geometry/cc-7th-area-circumference/v/area-of-a-circle>

9. Find the circumference and Area of the circle below. *Leave π in your answer or use π button and round to hundredth.*



$C = \underline{\hspace{2cm}}$ $A = \underline{\hspace{2cm}}$

PREALGEBRA AND ALGEBRA 1 SKILLS:

SIMPLIFYING EXPRESSIONS: Simplify expressions with numerical values and variables

- Order of Operations: <https://www.khanacademy.org/math/cc-sixth-grade-math/cc-6th-arithmetic-operations/cc-6th-order-of-operations/v/order-of-operations-1>
- Combining Like Terms: <https://www.khanacademy.org/math/cc-sixth-grade-math/cc-6th-expressions-and-variables/cc-6th-combining-like-terms/v/combining-like-terms-1>

SOLVING LINEAR EQUATIONS: Solve linear equations in one variable with coefficients represented by real numbers and variables

Solving: <https://www.khanacademy.org/math/algebra/x2f8bb11595b61c86:solve-equations-inequalities/x2f8bb11595b61c86:linear-equations-variables-both-sides/v/equations-3>

10. Simplify/Evaluate.

a. $4 - 2(3 - 2^2)$

b. $3x + 4x - 6x + 2x^2$

c. $-10 - 2x - 6 + 8x$

d. $2a + 4b - 8$; if $a = 3, b = -2$

11. Solve each of the following equations for x .

a. $2x + 4x = 18$

b. $1 + 2x = 8 + 4x$

c. $2(4x + 3) - 8 = 4 + 2x$

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

e. $2x + 8 + 112 = 180$

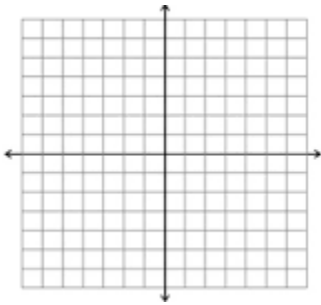
LINEAR FUNCTIONS: Calculate and interpret the average rate of change (slope) of a linear function and graph linear functions.

Slope: <https://www.khanacademy.org/math/algebra/two-var-linear-equations-and-intro-to-functions/slope/v/slope-intuition-example>

Slope-Intercept Form: <https://www.khanacademy.org/math/algebra/two-var-linear-equations-and-intro-to-functions/slope-intercept-form/v/graphing-a-line-in-slope-intercept-form>

12. Given two coordinate points M & N on the coordinate plane, find the slope of $\overleftrightarrow{MN}$, and state the slope of the line parallel and perpendicular to $\overleftrightarrow{MN}$.

$M(9, 6), N(1, 4)$



slope of $\overleftrightarrow{MN}$ = _____; parallel slope = _____; $\perp$ slope = _____

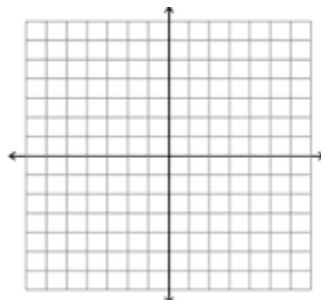
13. Find the slope and y-intercept of the given linear equation. Then, graph the line.

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

b. $y - 1 = 2(x + 1)$

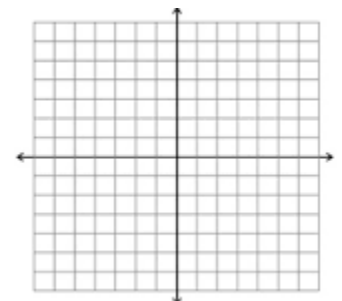
slope: _____

y - int: _____



slope: _____

y - int: _____



PROBABILITY AND STATISTICS: Represent data using multiple representations and measures of center. Determine the probability of a chance event.

Measures of Center: <https://www.khanacademy.org/math/statistics-probability/summarizing-quantitative-data/mean-median-basics/v/statistics-intro-mean-median-and-mode>

Probability: <https://www.khanacademy.org/math/statistics-probability/probability-library/basic-theoretical-probability/v/basic-probability>

Two-Way Tables: <https://www.khanacademy.org/math/cc-eighth-grade-math/cc-8th-data/two-way-tables/v/two-way-frequency-tables-and-venn-diagrams>

14. The data set below represents the heights of the male teachers at FWHS. Round to the nearest tenth.

Determine the following of the data set:

a. Mean = _____

b. Median = _____

c. Mode = _____

Mens Heights (Inches)

66 65 73 69 73 71 67
67 69 72 71 69 68 70
67 68 66

15. Ninth grade students were asked whether they participated in an after-school activity. Complete the two-way frequency table below.

After-school Activity

Gender	After-school Activity		
	Yes	No	Total
	Male	40	
	Female		95
	Total	102	187

16. You roll a standard 6-sided die. Find each probability for the number rolled.

a. $P(3)$

b. $P(\text{odd number})$

c. $P(7)$

d. $P(\text{number greater than 2})$

HONORS GEOMETRY ADDITIONAL QUESTIONS

SYSTEM OF EQUATIONS: Solve systems of equations consisting of two linear equations in two variables algebraically and graphically

Solving Linear Systems by Graphing: <https://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/systems-through-examples/v/solving-linear-systems-by-graphing>

Solving Linear Systems by Substitution: <https://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/systems-with-substitution/v/solving-systems-by-substitution-1>

Solving Linear Systems by Elimination/Combination: <https://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/solving-systems-addition-elimination/v/solving-systems-by-elimination>

Special types of Linear Systems: <https://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/systems-solutions/v/inconsistent-systems-of-equations>

17. Solve the following equations for x & y . Use any method.

a. $y = 3x - 4$

$$x - 4y = -28$$

b. $2x - 3y = 15$

$$-2x - 2y = 0$$

c. $y = 4x - 1$

$$y = -2x - 7$$

QUADRATIC EQUATIONS: Solve quadratic equations in one variable using square roots, factoring and quadratic formula

Factoring Quadratic Expressions:

<https://www.khanacademy.org/math/algebra/quadratics/factoring-quadratics/v/factoring-quadratic-expressions>

Solving Quadratic Equations by Square Roots:

<https://www.khanacademy.org/math/algebra/quadratics/quadratics-square-root/v/solving-quadratic-equations-by-square-roots>

Solving Quadratic Equations using the Quadratic Formula:

<https://www.khanacademy.org/math/algebra/quadratics/quadratic-formula/v/using-the-quadratic-formula>

Solving Quadratic Equations by Completing the Square:

<https://www.khanacademy.org/math/math2/xe2ae2386aa2e13d6:quad-2/xe2ae2386aa2e13d6:completing-sq/v/solve-completing-square-integer-solutions>

18. Factor each expression completely.

a. $x^2 - 25$

b. $x^2 + 2x - 8$

c. $2x^3 + 4x^2 - 6x$

d. $2x^2 - 3x - 9$

19. Solve the following quadratic equations using any method. Non-Calculator, leave solution(s) in simplest radical form.

a. $3x^2 = 48$

b. $x^2 - 12 = 0$

c. $x^2 - 9x - 36 = 0$

d. $2x^2 - 15x - 8 = 0$

20. Using the Quadratic Formula to solve the following quadratic equation. Leave solution(s) in simplest radical form and round to the nearest hundredth.

a. $x^2 + 4x + 2 = 0$

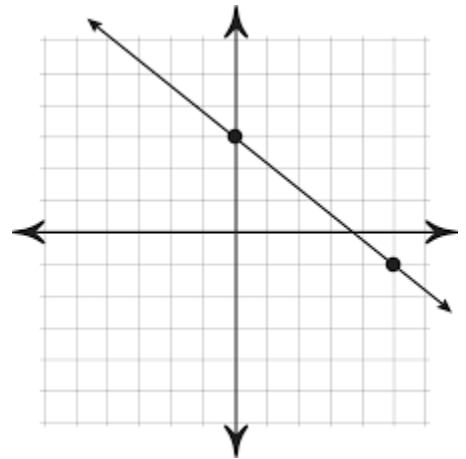
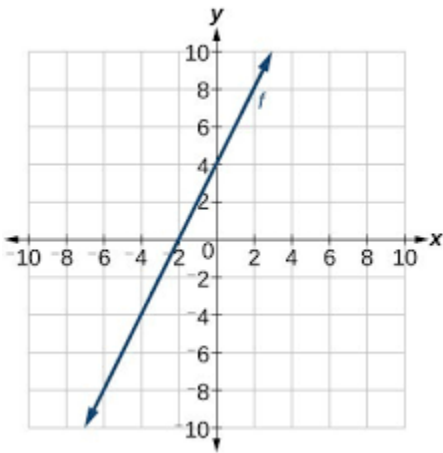
b. $2x^2 - 3x - 4 = 0$

21. Solve the quadratic equation by completing the square. Leave solution(s) in simplest radical form and round to the nearest hundredth.

a. $x^2 - 4x = 5$

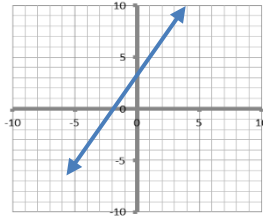
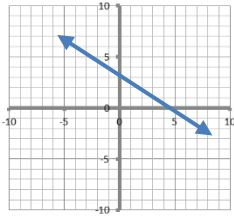
b. $x^2 - 10x + 10 = 0$

22. Determine the equation of the given lines. Write your answer in slope-intercept form.



Answer Key

1. a. *right*; $x + 2x = 90$; $30^\circ, 60^\circ$; *compl.*
b. *straight*; $y + y + 40 = 180$; $70^\circ, 110^\circ$; *suppl.*
2. a. $\frac{7}{12}$, b. $\frac{5}{12}$, c. $\frac{2}{3}$
3. a. Not proportional
b. Proportional
4. $x = 9.6$
5. $x = 7$
6. $x = -14$
7. a. $x = \sqrt{192}$ or 13.86; b. $x = 5$
8. a. $2\sqrt{5}$; b. $3\sqrt{5}$; c. $6\sqrt{2}$
9. $C = 16\pi$ or 50.27cm, $A = 64\pi$ or 201.06cm²
10. a. 6; b. $2x^2 + x$; c. $6x - 16$; d. -10
11. a. $x = 3$; b. $x = -3.5$; c. $x = 1$; d. $x = \frac{1}{2}$; e. $x = 30$
12. slope of $\overrightarrow{MN} = \frac{1}{4}$, parallel to $\overrightarrow{MN} = \frac{1}{4}$, perpendicular to $\overrightarrow{MN} = -4$
11. a. slope: $-\frac{2}{3}$, y - int: 3
b. slope: 2, y - int: 3



14. a. 68.9
b. 69
c. 67 and 69

15.

	Yes	No	Total
Male	52	40	92
Female	50	45	95
Total	102	85	187

16. a. $\frac{1}{6}$
b. $\frac{1}{2}$
c. 0
d. $\frac{2}{3}$

HONORS:

17. a. $x = 4, y = 8$ or (4, 8)
b. $x = 3, y = -3$ or (3, -3)
c. $x = -1, y = -5$ or (-1, -5)
18. a. $(x + 5)(x - 5)$
b. $(x + 4)(x - 2)$
c. $2x(x + 3)(x - 1)$
d. $(2x + 3)(x - 3)$
19. a. $x = \pm 4$
b. $x = \pm 2\sqrt{3}$
c. $x = 12, -3$
d. $x = -\frac{1}{2}, 8$
20. a. $x = -2 \pm \sqrt{2} = -0.59, -3.41$
b. $x = \frac{3 + \sqrt{41}}{4} = 2.35, -0.85$
21. a. $x = 5, -1$; b. $x = 5 \pm \sqrt{15}$ or 8.87, 1.13
22. a. $y = 2x + 4$; b. $y = -\frac{4}{5}x + 3$