

# Geometry

# Summer Prep Packet

Welcome to Geometry! This packet is for all students entering Honors Geometry or Geometry.

Attached, you will find the basic learning targets from Algebra 1 that you are expected to remember **BEFORE** you come to class in the fall. Honors Geometry students should complete ALL problems and regular Geometry students should complete all problems WITHOUT the “H” in front.

For each topic addressed, this packet contains review examples, properties, definitions, and online video tutorial links followed by practice problems. This material must be mastered in order for you to be successful in Geometry. You will be assessed at the beginning of the school year. Since this material is designed as a review, you are responsible for completing this packet on your own. The packet will be graded to assess the student’s efforts to recall this information. Be sure to **SHOW ALL WORK!**

**Name:** \_\_\_\_\_

# **Target Checklist**

## **Target 1: Solving Equations**

- ☐ A. Simplifying Expressions
- ☐ B. Solving Multistep Equations
- ☐ C. Applying Formulas
- ☐ D. Solving Inequalities
- ☐ E. Number Line Graphing
- ☐ F. System of Equations

## **Target 2: Polygon Classification and Measurement**

- ☐ A. Classifying Polygons by Sides
- ☐ B. Perimeter and Area of Parallelograms and Triangles
- ☐ C. Basic Parts Of A Circle - Center, Diameter, Radius
- ☐ D. Area and Circumference of a Circle
- ☐ E. Volume of Rectangular Prism
- ☐ F. Unit conversion

## **Target 3: Linear Equations**

- ☐ A. Graphing Points On A Coordinate Plane
- ☐ B. Find Slope Given Two Points
- ☐ C. Find Slope Given A Graph
- ☐ D. Rewrite and Graph Linear Equations
- ☐ E. Write Equations for Lines (Point-Slope, Slope-Intercept, Standard Form, Horizontal, Vertical, Parallel, Perpendicular)

## **Target 4: Exponents and Radicals**

- ☐ A. Simplifying Perfect Square Radicals
- ☐ B. The Pythagorean Theorem
- ☐ C. Simplifying Exponents Using Exponent Rules
- ☐ D. Factoring Polynomials

## **Target 5: Proportions**

## Target 1: Solving Equations

### A. Simplifying Expressions

- Parentheses or other grouping symbols
- Exponential expressions
- Multiplication AND Division (whichever one comes first)
- Addition AND Subtraction

Need help? Watch an Order of Operations Video.



Simplify each numerical expression.

1.  $6 + 2 - 7$  \_\_\_\_\_      2.  $4 \cdot 7 - 5$  \_\_\_\_\_      3.  $2 + 13 \div 2 - 7$  \_\_\_\_\_

4.  $5 + 4 - 15 \div 3$  \_\_\_\_\_      5.  $8 \cdot (3 + 5)$  \_\_\_\_\_      6.  $(4 + 8) \div (2 - 1)$  \_\_\_\_\_

7H.  $25 - (2^4 + 6 \cdot 2 - 3)$  \_\_\_\_\_

8H.  $\frac{15 - [8 - (2 + 5)]}{18 - 6^2}$  \_\_\_\_\_

9H.  $100 - [20(2) \div 6 + 15 \div 5]$  \_\_\_\_\_

Need help with Fractions? Watch a video.

Addition



Multiplication



Division



$$10. \frac{3}{8} + \frac{7}{8} = \underline{\hspace{2cm}}$$

$$11. \frac{2}{3} - \frac{3}{4} = \underline{\hspace{2cm}}$$

$$12. \frac{3}{4} \times \frac{2}{3} = \underline{\hspace{2cm}}$$

$$13. \frac{7}{16} \times \frac{4}{3} = \underline{\hspace{2cm}}$$

$$14. \frac{15}{64} \times \frac{1}{12} = \underline{\hspace{2cm}}$$

$$15. \frac{4}{11} \div \frac{1}{11} = \underline{\hspace{2cm}}$$

$$16. \frac{2}{3} \div 4 = \underline{\hspace{2cm}}$$

**Need help with FOIL? Watch a video.**



17.  $(x + 3)(x - 5)$  \_\_\_\_\_ 18.  $(x + 4)(x - 4)$  \_\_\_\_\_

19.  $(x - 5)^2$  \_\_\_\_\_

## **B. Solving Equations**

**Need help with solving equations? Watch a video.**

Equations with Parentheses



Variables on Both Sides of the Equation



Solve for the variable. Show your work.

1.  $42 = -2d + 6$

2.  $15y + 31 = 61$

3.  $4b + 2 = 3b$

$$4. 2(x + 3) = 10$$

$$5. 3(x - 4) = 48$$

$$6. 2y - 7 + 5y = 0$$

$$7. 2x - 1 = x + 11$$

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

$$9H. 17 = 3(p - 5) + 8$$

$$10H. 28 = 8x + 12 - 7x$$

$$11H. 5(1 - 2w) + 8w = 15$$

$$12H. 3c - 4c + 1 = 5c + 2 + 3$$

## C. Applying Formulas

Need help evaluating formulas? Watch a video.



1. Algebraic Expressions:  $12a - 4a^2 + 7a^3$  if  $a = -4$  \_\_\_\_\_

2. Simple Interest:  $I = Prt$  if  $P = \$8000$ ,  $r = 7.5\%$ ,  $t = 3$  \_\_\_\_\_

3. Temperature:  $F = \frac{9}{5}C + 32$  if  $C = -10$  \_\_\_\_\_

4H. Quadratic Formula:  $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$  if  $a = 2$ ,  $b = -3$ ,  $c = -10$  \_\_\_\_\_

## D. Solving Inequalities

Need help Solving Inequalities? Watch a video.



Solve for the variable. Show your work.

1.  $-12 + q > 39$

2.  $-40 \geq 8b$

3.  $\frac{2}{3}k > 6$

4.  $\frac{b}{-2} \geq 8$

5.  $2m + 1 > 13$

6.  $\frac{4+x}{3} > -4$

7H.  $4 - x > 3(4 - 2)$

8H.  $-4(3 - p) > 5(p + 1)$



## E. Number Line Graphing

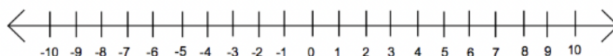
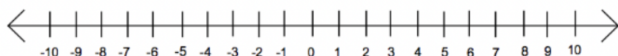
Need help graphing inequalities? Watch a video.



Graph the inequality on the number line below.

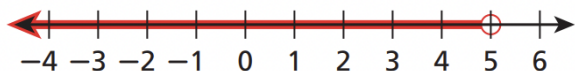
1.  $x > -2$

2.  $0 < x$



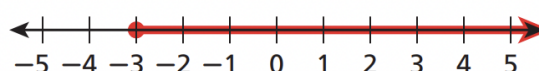
Write the inequality displayed in the graph.

3.



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4.



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## F. Systems of Equations

Need help solving systems? Watch a video.

Graphing Method



Substitution Method



Elimination Method



1. Solve the system using substitution:  $x = \underline{\hspace{1cm}}$   $y = \underline{\hspace{1cm}}$

$$\begin{aligned}x &= -y + 5 \\ 2x + 3y &= 12\end{aligned}$$

2. Solve the system using elimination:  $x = \underline{\hspace{1cm}}$   $y = \underline{\hspace{1cm}}$

$$\begin{aligned}2x + 3y &= 15 \\ x - 3y &= 3\end{aligned}$$

3H. Solve the system using elimination:  $x = \underline{\hspace{1cm}}$   $y = \underline{\hspace{1cm}}$

$$\begin{aligned}x + y &= 4 \\ 2x - 3y &= 18\end{aligned}$$

**Target 2: Polygon Classification and Measurement**

**A. Classifying Polygons by Sides**

Name the shape.



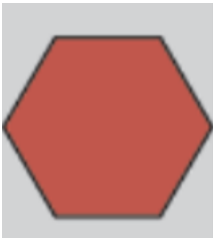
1H. \_\_\_\_\_



2H. \_\_\_\_\_



3H. \_\_\_\_\_



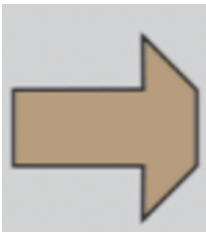
4H. \_\_\_\_\_



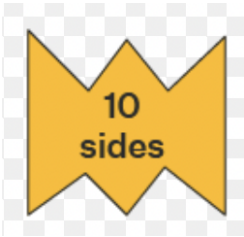
5. \_\_\_\_\_



6. \_\_\_\_\_



7. \_\_\_\_\_



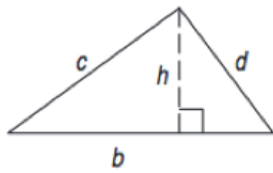
8. \_\_\_\_\_

9. Complete the Table.

Name of Shape	Number of Sides
Triangle	
Quadrilateral	
Pentagon	
Hexagon	
Heptagon	
Octagon	
Nonagon	
Decagon	

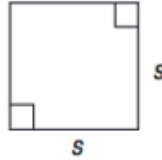
## B. Perimeter and Area of Parallelograms and Triangles

### Formulas



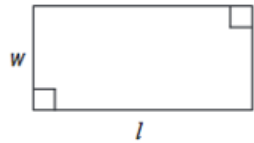
$$P = b + c + d$$

$$A = \frac{1}{2}bh$$



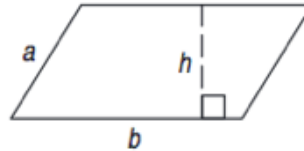
$$P = 4s$$

$$A = s \cdot s$$



$$P = 2l + 2w$$

$$A = lw$$



$$P = 2a + 2b$$

$$A = bh$$

**Need help with Area? Watch a video.**

Area of rectangles



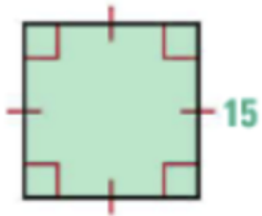
Area of parallelograms



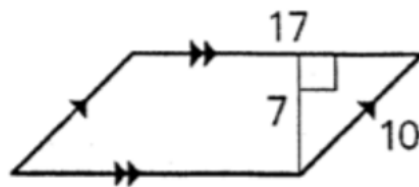
Area of triangles



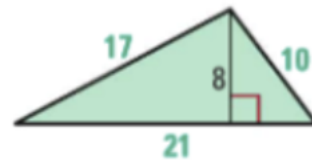
Find the perimeter and area of the polygons.



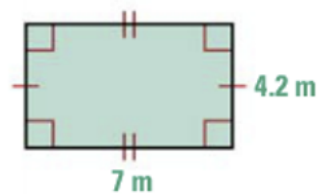
1. \_\_\_\_\_



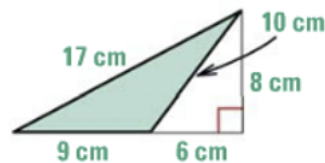
2. \_\_\_\_\_



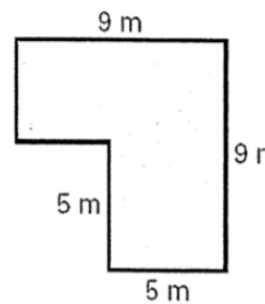
3. \_\_\_\_\_



4. \_\_\_\_\_



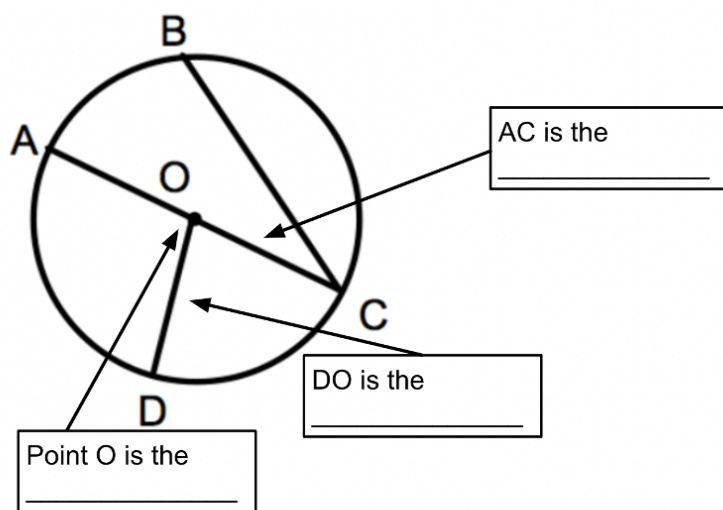
5. \_\_\_\_\_



6. \_\_\_\_\_

## C. Basic Parts Of A Circle - Center, Diameter, Radius

1. Label the parts of the circle.



## D. Area and Circumference of a Circle

Need help? Watch a video.

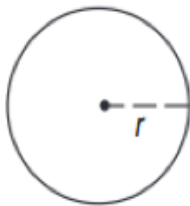
Circumference



Area of circles

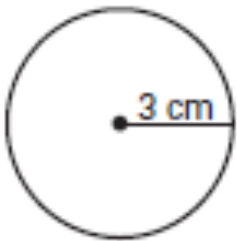


Formulas

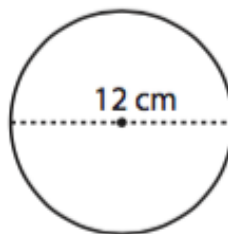


$$C = 2\pi r$$
$$A = \pi r^2$$

Find the Circumference of the circle. Show your work.

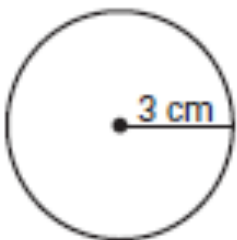


1. \_\_\_\_\_

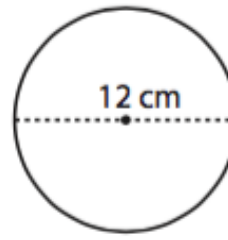


2. \_\_\_\_\_

Find the Area of the circle. Show your work.



3. \_\_\_\_\_



4. \_\_\_\_\_

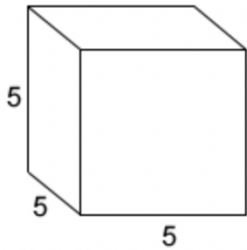
## E. Volume of Rectangular Prism

Need help? Watch a video.

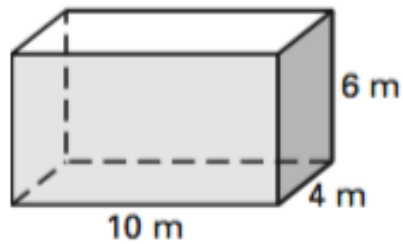
Volume of Rectangular Prism



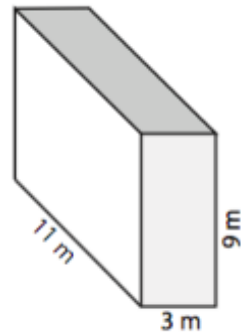
Find the Volume of the prism. Show your work.



1. \_\_\_\_\_



2. \_\_\_\_\_



3. \_\_\_\_\_

## F. Unit conversions

Length (U.S.)
1 foot = 12 inches
1 yard = 3 feet
1 mile = 5280 feet
1 inch = 2.54 cm
1 meter = 100 cm

Example: Convert 10000 feet to miles. Show your conversions.

$$\frac{10000 \cancel{\text{feet}}}{1} \times \frac{1 \cancel{\text{mile}}}{5280 \text{ feet}} = 1.9 \text{ miles}$$

Example 2: Convert 5 miles to feet. Show your conversions.

$$\frac{5 \cancel{\text{miles}}}{1} \times \frac{5280 \text{ feet}}{1 \cancel{\text{mile}}} = 26400 \text{ feet}$$

**Need help? Watch a video.**



Show your conversions. See examples above.

1. Convert 5 feet to inches.

2. Convert 20 yards to feet.

3. Convert 850 centimeters to meters.

4H. Convert 24 inches to centimeters.

5H. Convert 74 inches to feet.

6H. Convert 74 inches to yards.



## Target 3: Linear Equations

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

Slope-intercept form:  $y = mx + b$  (given  $m = \text{slope}$ ,  $b = y \text{ intercept}$ )

Point-slope form:  $y - y_1 = m(x - x_1)$  (given  $m$  and point  $(x_1, y_1)$ )

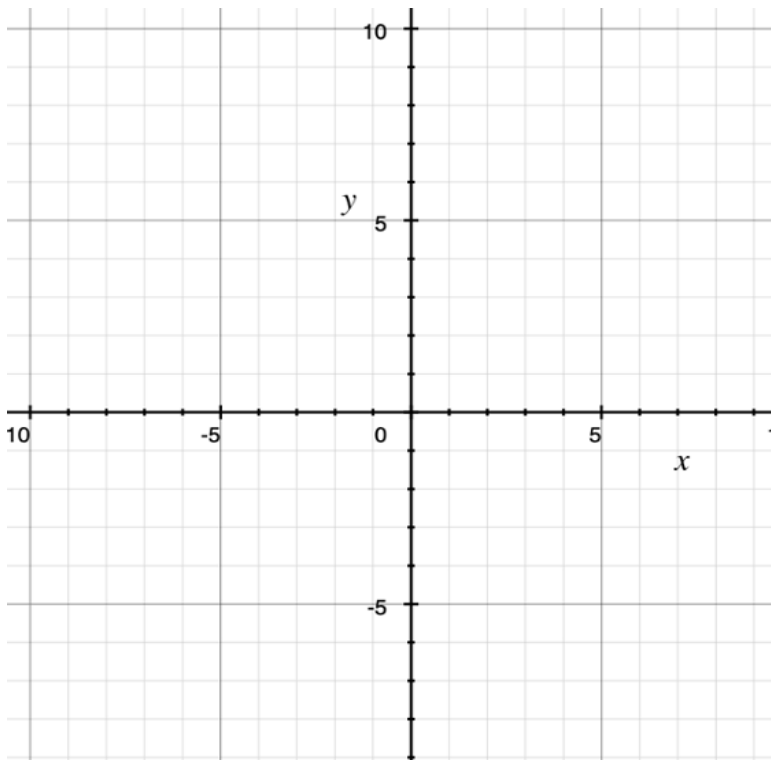
### A. Graphing Points on a Coordinate Plane

Need help with plotting points? Watch a video.



1: Plot the points on the graph provided and label each point with the letter.

A  $(-2, 3)$ , B  $(-4, -6)$ , C  $(2, 9)$ , D  $(7, -3)$ , E  $(0, 6)$ , F  $(-7, 0)$



**B. Find the slope of the line passing through each pair of points.**

**Need help with finding slope? Watch a video.**



1.  $(-3, -5)$  and  $(-2, 6)$       2.  $(-4, -6)$  and  $(-4, -9)$       3.  $(5, 3)$  and  $(-11, 3)$

**C. Find the slope of each line from its graph.**

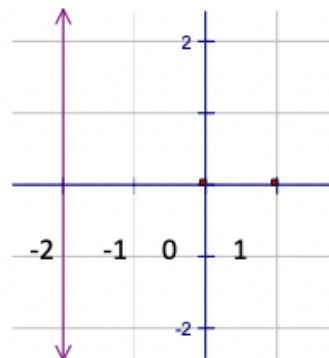
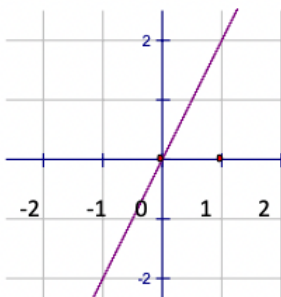
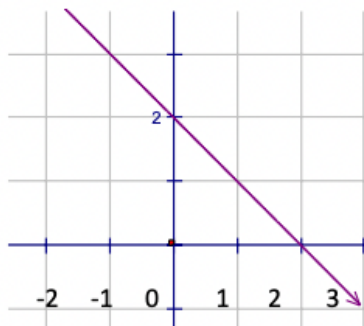
**Need help with finding slope from a graph? Watch a video.**



1. Slope = \_\_\_\_\_

2. Slope = \_\_\_\_\_

3. Slope = \_\_\_\_\_

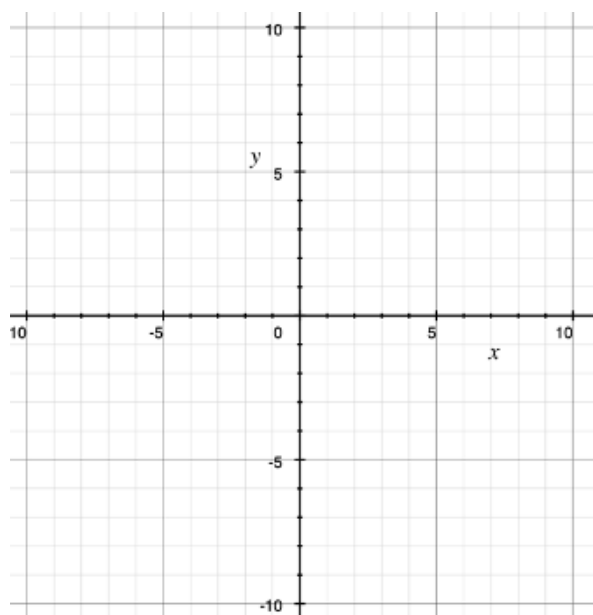


## D. Rewrite and Graph Linear Equations

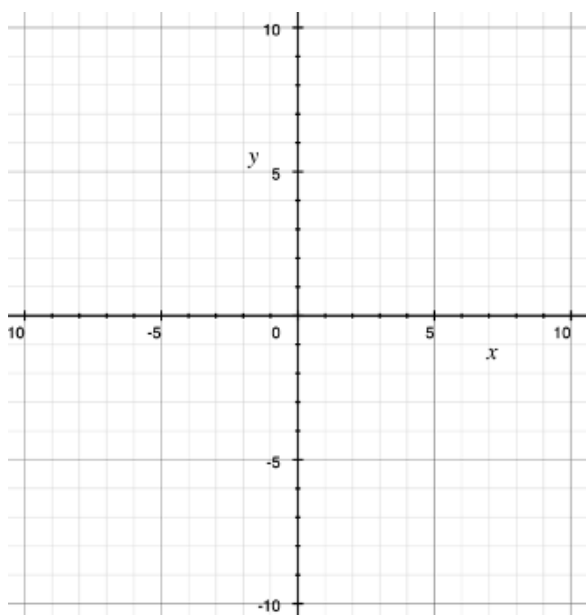
Need help with graphing linear equations? Watch a video.



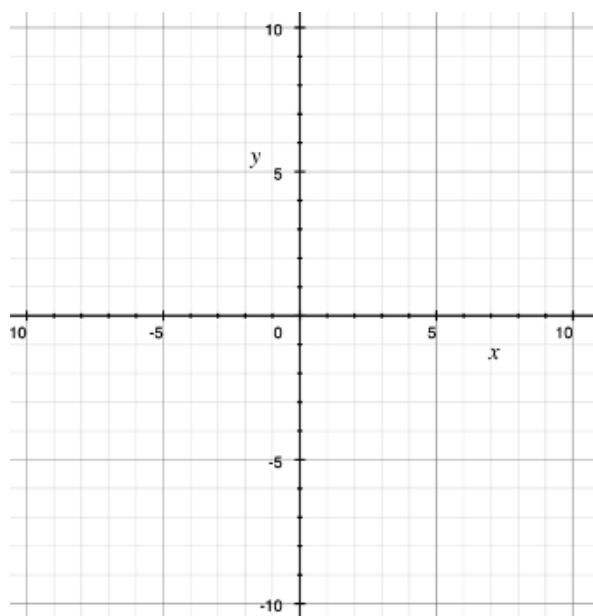
1.  $y = -3x + 4$



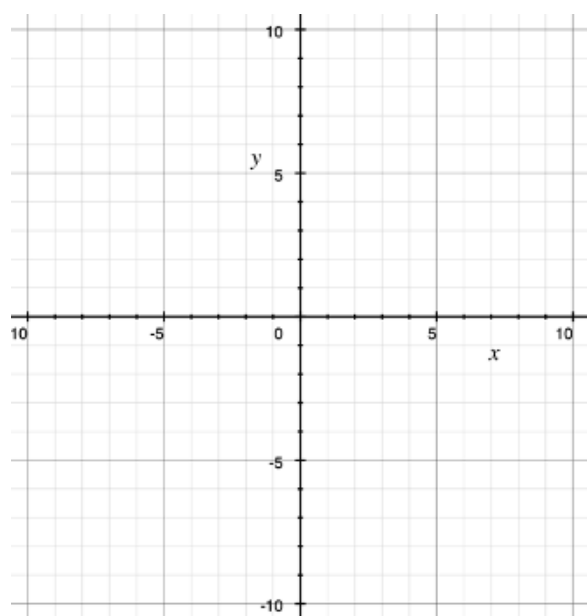
2H.  $4 + y = x$



3H.  $x = -5$



4H.  $y = 1$



## E. Write Equations for Lines (Point-Slope, Slope-Intercept, Standard Form, Horizontal, Vertical, Parallel, Perpendicular)

Need help with writing linear equations? Watch a video.



Slope-Intercept form



Point-Slope Form



Standard Form



Writing Equations of  
Perpendicular Lines



Writing Equations of  
Parallel Lines

1. Write an equation for a line with a slope of  $\frac{1}{2}$  that goes through the point  $(-6, 8)$ :
2. Write an equation in slope intercept form, where the slope is  $-5$  and the y-intercept is 3:
3. Rearrange  $4x + 2y = 10$  from standard form to slope intercept form  $y = mx + b$ :

4H. Write the equation of a line that has a slope of *zero* and goes through the point  $(2, 3)$ :

5H. Write the equation of a line that has an *undefined* slope and goes through the point  $(2, 3)$ :

6H. Write an equation that is *parallel* to the line  $y = 2x + 4$  and goes through the point  $(-1, 6)$ :

7H. Write an equation that is *perpendicular* to the line  $y = 2x - 5$  and goes through the point  $(-8, 0)$ :

## Target 4: Exponents and Radicals

### A. Simplifying Perfect Square Radicals

Need help with exponents and square roots? Watch a video.



1.  $\sqrt{25} =$  \_\_\_\_\_

2.  $\sqrt{100} =$  \_\_\_\_\_

3.  $11^2 =$  \_\_\_\_\_

4.  $-\sqrt{64} =$  \_\_\_\_\_

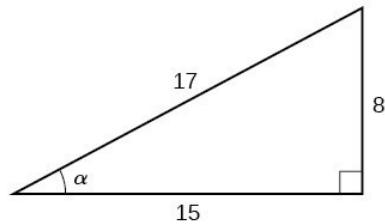
5.  $(-3)^2 =$  \_\_\_\_\_

## B. Pythagorean Theorem ( $a^2 + b^2 = c^2$ )

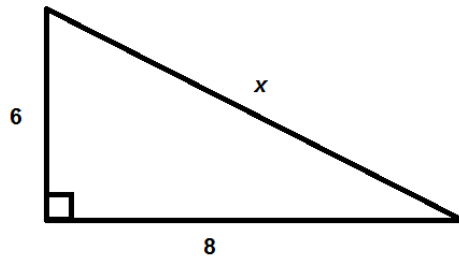
Need help with Pythagorean Theorem? Watch a video.



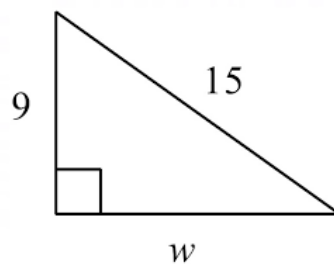
1. What is the length of the **hypotenuse** in the right triangle: \_\_\_\_\_



2. Find the length of the hypotenuse using the Pythagorean Theorem: \_\_\_\_\_



3H. Find the length of  $w$  using the Pythagorean Theorem: \_\_\_\_\_



## C. Simplifying Exponents Using Exponent Rules

Need help with Exponent Rules? Watch a video.



1.  $x^3 * x^2 =$  \_\_\_\_\_

2.  $\frac{x^7}{x^2} =$  \_\_\_\_\_

3.  $(x^4)^5 =$  \_\_\_\_\_

4.  $x^{-4} =$  \_\_\_\_\_

5H.  $3x^4 * 7x^9 =$  \_\_\_\_\_

6H.  $\frac{6p^8}{3p} =$  \_\_\_\_\_

7H.  $(3x^2)^3 =$  \_\_\_\_\_

8H.  $5x^{-6} =$  \_\_\_\_\_



## D. Factoring

Need help with factoring? Watch a video.



Factoring: Leading  
Coefficient = 1



Finding a GCF



Factor a Difference  
of Squares

1. Factor the trinomial:  $x^2 + 7x + 12$

2. Factor the trinomial:  $x^2 - 8x + 15$

3. Factor the trinomial:  $x^2 + 3x - 10$

4H. Factor the difference of squares:  $x^2 - 16$

5H. Factor the polynomial by finding a GCF:  $9x + 27$

6H. Factor the polynomial by finding a GCF:  $8x^2 - 24x$

## Target 5: Proportions

A. Solve proportions using cross product property.

Need help? Watch a video.



$$1. \frac{5}{10} = \frac{x}{16}$$

$$2. \frac{16}{18} = \frac{24}{x}$$

$$3. \frac{5}{4} = \frac{15}{x}$$

$$4. \frac{2x}{3} = \frac{12}{2}$$

$$5. \frac{x+2}{4} = \frac{27}{12}$$

$$6. \frac{3}{x+5} = \frac{2}{x+1}$$