



Pensacola Catholic High School
Math Department
Summer Packet | For Students Entering Algebra I Honors

Dear Parent/Guardian and Student,

The Math Department at Pensacola Catholic High will require the completion of a summer packet for each student entering an Honors math course. The problems on this packet are due the second day of Math class (Tuesday, August 10th or Wednesday, August 11th depending on your course schedule). The packet has two purposes: (1) to help you retain the math knowledge you've gained in your previous math classes, and (2) to get a sense of what we expect you to know going into your next class. Here are some tips for working through the packet:

1. We encourage you to work on this packet throughout the summer rather than doing the entire packet at the start or end of the summer. That way you keep the topics you learned fresh in your mind. Do not wait until the last minute to complete this packet!
2. You should complete every problem on the packet and show your work on each problem. Use extra paper if absolutely needed, clearly identifying each problem. All work should be neat, complete, and organized. No problem should be left blank, and no work means no credit.
3. You should not feel obligated to hire an outside tutor. We will spend the first week reviewing material that is necessary. However, you will be tested at the end of the first week on all material in the packet. If you are struggling with the packet, there are free resources, like Khan Academy, that can help.
4. Calculators are allowed for the completion of this packet, but please do not rely on your calculator for the answer. Your assessment will be taken without a calculator.
5. This packet will be graded for correctness and will be one of the first grades of Quarter 1.

Enjoy your Summer and Best of Luck!!
Mrs. Gottstine

Add, Subtract, Multiply, Divide: Integers (NO Calculator)

Note: In order to be successful in Algebra 1 it is absolutely critical that you are very comfortable with integer operations. **You must complete these *without* a calculator.**

$5 - 11 =$	$-6 - 8 =$	$12 - 15 =$	$-11 - 3 =$	$-12 + 18 =$
$-13 + 24 =$	$14 - 38 =$	$-1 - 17 =$	$-90 + 101 =$	$55 - 44 =$
$-\frac{18}{3} =$	$-\frac{90}{5} =$	$\frac{44}{4} =$	$-\frac{92}{2} =$	$-\frac{39}{3} =$
$14 \cdot 3 =$	$-4 \cdot 8 =$	$-5 \cdot -2 =$	$-8 \cdot 11 =$	$-6 \cdot 9 =$
$-5 + (-3) =$	$-1 + (-6) =$	$-11 - (-5) =$	$-2 - (-3) =$	$-5 - 1 =$
$16 - (-3) =$	$-15 - (-5) =$	$-1 - 1 =$	$-1 - (-1) =$	$12 - 42 =$

Add, Subtract, Multiply, Divide: Fractions (NO Calculator)

1. Perform the indicated operation on the fractions. Reduce answer to simplest form.

$\frac{2}{3} + \frac{3}{6} =$	$\frac{4}{9} - \frac{5}{3} =$	$3\frac{3}{4} + 2\frac{2}{5} =$
$\frac{5}{6} \cdot \frac{6}{7} =$	$\frac{7}{3} \cdot \frac{-11}{49} =$	$\frac{12}{25} \div \frac{2}{5} =$
$\frac{5}{25} \div \frac{6}{3} =$	$-\frac{11}{14} + \frac{2}{7} =$	$-\frac{4}{9} + \frac{-3}{8} =$
$\frac{3}{4} + \frac{7}{10} =$	$10 - \frac{6}{5} =$	$-\frac{10}{4} - \frac{7}{8} =$

2. A 12-inch board is cut into sections that are $\frac{3}{4}$ inches long each. How many sections can you make?

3. At a party the host orders 12 pizzas that are cut into 8 slices each. There are 30 people at the party. How many slices does each person get? Write your answer as a mixed number.

4. A brand new motorcycle gets 70 miles per gallon of gas. If the motorcycle drives 520 miles before running out of gas, how much gas started in the tank? Write your answer as a mixed number.

Add, Subtract, Multiply, Divide: Decimals (NO Calculator)

Decimals will actually not be used very much in Algebra 1, as we will prefer to keep our answers in fraction form. However, it is still an important developmental step to be comfortable working with decimal values, and they tie in to percentages.

$4.2 + 6.8 =$	$-8.1 + 5.9 =$	$-3.3 + 9 =$	$14.32 + 7.7 =$
$-3.5 - 7.2 =$	$5 - 4.31 =$	$-8.1 - 4.9 =$	$-48.3 - (-2.8) =$
$-6.3 / 2 =$	$-9.9 / 5 =$	$1.8 / 9 =$	$19.2 / 2 =$
$4.5 \cdot 3 =$	$(1.6)(2.7) =$	$-9.1 \cdot -5 =$	$(2.4) \cdot (-3.1) =$

Percentages

1. Explain in words how to convert from a decimal to a percent:
2. Explain in words how to convert from a percent to a decimal:
3. What is 30% of 60?
4. 20 is 10% of what number?
5. $6\frac{1}{4}\%$ interest on \$150 is how much money?
6. 30 is what percent of 200?
7. What is 42% of 50?
8. 30% of what number is 60?
9. A basketball player makes 14 out of 22 free throws. What is their shooting percentage?
10. What is the percent chance a six-sided die is rolled and a 5 comes up?
11. If the value of your \$20 baseball card goes up by 15%, how much is it worth now?
12. If the value of your new \$18,000 car goes down by 25%, how much is it worth now?

Proportions

1. Solve each equation, showing your work. (hint: cross multiply if you are stuck!)

$\frac{4}{x} = \frac{10}{11}$	$\frac{4x}{15} = \frac{3}{25}$	$\frac{8}{15} = \frac{6}{5x}$
$\frac{x}{8} = \frac{3}{10}$	$\frac{6x}{5} = -\frac{2}{18}$	$\frac{4}{x} = \frac{10}{7}$
$\frac{12}{5x} = \frac{24}{10}$	$-\frac{6}{100} = \frac{3x}{33}$	$\frac{x}{18} = -1$

2. If the ratio of chickens to ducks is five to three and there are 42 ducks, how many chickens are there?
3. If a 12 foot tree casts a 3 foot shadow, how tall is a tree that casts a 9 foot shadow?
4. If you can sell 6 carved figurines for \$20, how many carved figurines will you need to earn \$150?
5. If you can run a third of a mile in 2 minutes and 20 seconds, how long will it take you to run 4 miles, assuming you are perfectly fit and never get tired?

Simplifying Expressions Using PEMDAS

1. Simplify each expression:

$\frac{(5-3)^2}{8} =$	$4(2-5) + 3 =$	$4 - 2(5+1) =$	$(6-2)^2 =$
$5 - 3(4+6) =$	$3^2 - 2^2 + 5 =$	$5 - 4 + 2 - 6 =$	$\frac{18}{3} + \frac{4}{2} - \frac{6}{3} =$
$5(3 - 5^2) =$	$10 - 4(3) =$	$-4 - 6(1 + 4) =$	$11 - 11(5 - 6) =$
$6 - 2(5 \cdot 2 - 1) =$	$5 \cdot 3 - 8 =$	$-7 - 4 \cdot 2 =$	$-5 - 8(4 - 4) =$

2. Simplify by combining like terms (distribute first if needed):

$4x + 3 - 2x - 6 =$	$5x + 10 - 2x - 4 =$	$5(x - 2) + 10 =$
$5 - (4 - 2x) =$	$x - 3 + 3(x - 4) =$	$11x + 2 - (11x + 2) =$

3. Let $x = 3$ and $y = 2$. Substitute to find the value of the expression: $\frac{y(xy-7)}{10}$

4. Let $a = -5$ and $b = 4$. Substitute to find the value of the expression: $\frac{a^2(b-a)}{a+b}$

5. Complete the table for the following equation. Show work in the space to the right.

x	$y = 5x + 2$
-3	
1	
2	
3	

Solving Equations

We will spend a lot of time on solving equations in Algebra 1. However, you should come in already understanding the basic idea of keeping the equation balanced by applying the same operation to both sides of the equation.

$5 + x = 11$	$-6 + x = -18$	$7 - x = 14$
$5x = 35$	$7x = 24.5$	$80 = 16x$
$\frac{x}{5} = 13$	$\frac{x}{2} = -6$	$\frac{x}{14} = 3$
$3x + 5 = 14$	$5x + 1 = 31$	$-2x + 9 = -1$
$\frac{x}{3} - 2 = 10$	$\frac{x}{5} + 8 = 13$	$6 - \frac{x}{3} = 12$

Square Roots

1. Find each square root.

a. $\sqrt{144}$

b. $\sqrt{25}$

c. $\sqrt{64}$

d. $\sqrt{49}$

2. State what two integers each square root is between.

a. $\sqrt{5}$

b. $\sqrt{60}$

c. $\sqrt{40}$

d. $\sqrt{115}$

Prime Factoring a Number

1. Write the prime factorization for each number.

a. 440

b. 96

c. 650

d. 305

Basic Exponents

1. Simplify each exponential expression. Leave the answer in exponent form.

$\frac{3^7}{3^2} =$	$4^5 \cdot 4^3 =$	$5x \cdot 3x =$	$\frac{11a^2b}{11a^2b} =$
$\frac{2^5}{2} =$	$9^6 \cdot 9 =$	$6x^2 - 2x^2 =$	$\frac{14x^3}{14x^3} =$
$(x^3)^5 =$	$5^3 \cdot 5^3 =$	$x^4 \cdot x^{11} =$	$\frac{-2L^4}{-2L^4} =$

Scientific notation, multiply and divide by 10,100,etc

1. Write each number in scientific notation:

a. $62,000 =$ _____

b. $.000000824 =$ _____

2. Rewrite the scientific notation in standard decimal notation:

a. $4.385 \times 10^{-3} =$ _____

b. $1.8 \times 10^5 =$ _____

3. Perform the indicated operations using mental math:

a. $32 \cdot 10 =$

b. $1.65 \cdot 10 =$

c. $0.054 \cdot 10 =$

d. $97 \cdot 100 =$

e. $3.64 \cdot 100 =$

f. $774 \cdot 1000 =$

g. $0.095 \cdot 1000 =$

h. $32/10 =$

i. $5.5/10 =$

j. $0.03/10 =$

k. $544/100 =$

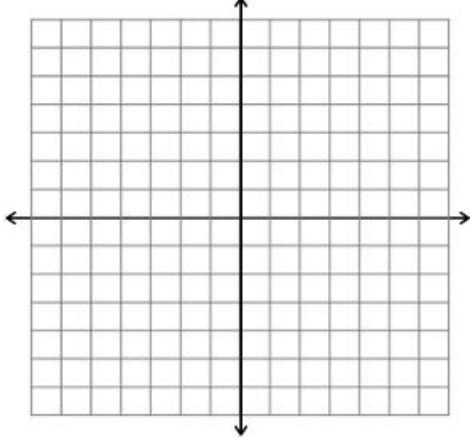
l. $6.21/100 =$

m. $918/1000 =$

n. $5.27/1000 =$

Graphing coordinate points

1. Plot each point on the graph to the right and label it with the given letter.

<p>a. (3, 5) b. (1, 7) c. (-2, 4) d. (3, -3) e. (6, 0) f. (-1, 2) g. (4, -1) h. (-5, -7) i. (0, -4)</p>	
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Linear Functions: Slope, y-intercepts, graphing

1. Find the slope of the line that contains each pair of points:

a. (-2, 3) and (4, -1)

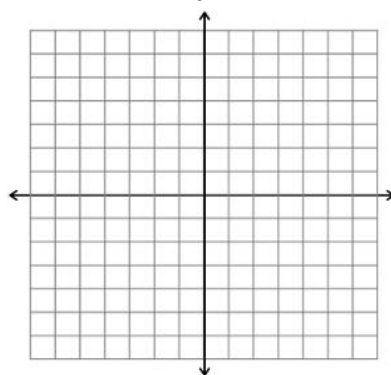
b. (4, -3) and (-8, -9)

c. (-6, 5) and (-6, 2)

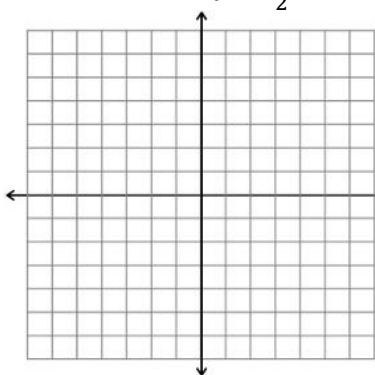
d. (-1, 4) and (5, 4)

2. Write down the slope and y-intercept for each equation, then graph it.

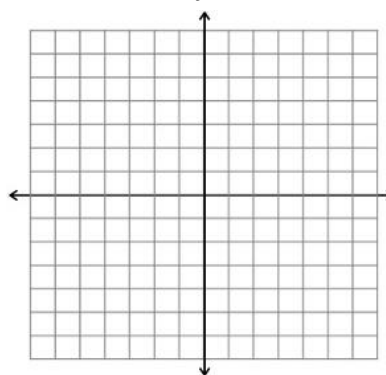
a. $y = 3x - 5$



b. $y = \frac{1}{2}x + 12$



c. $y = 5 - 4x$



Measurement and Geometry

1. What are the formulas for the area of each shape:
 - a. Square:

 - b. Rectangle

 - c. Triangle

 - d. Circle

2. What are the formulas for the perimeter of each shape:
 - a. Square:

 - b. Rectangle

 - c. Triangle

 - d. Circle

3. What are the area and perimeter of a square with a side length of 6 inches?

4. What are the area and perimeter of a rectangle with length 8 ft and width 12ft?

5. What are the area and perimeter of right triangle that has side lengths 5, 12, and 13?

6. What are the area and circumference of a circle with a radius of 4m?

7. If you add the three angles in a triangle, how many total degrees is it?

8. If you add the four angles in a rectangle, how many total degrees is it?

Mixed Review

1. Complete the table

<u>Fraction</u>	<u>Decimal</u>	<u>Percent</u>
$\frac{1}{4}$	_____	_____
$\frac{8}{100}$	_____	_____
$\frac{3}{5}$	_____	_____
_____	0.125	_____
_____	0.75	_____
_____	0.05	_____
_____	_____	14 %
_____	_____	125 %
_____	_____	2.3 %

2. Jeff drove 32 miles per hour for 30 mins and at 48 miles per hour for 45 mins. How far did he travel total?
3. There are 25 children in the class. $\frac{3}{5}$ of the children are boys, how many are girls?
4. A mix weighs 38 pounds. If the mix is 80% sand by weight, about how many pounds of sand are in the mix?
5. Fifteen lbs of meat will be divided into portions of $\frac{1}{4}$ lb each. How many portions can be made?