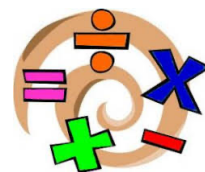


## Summer Math Review 2021: 7<sup>th</sup> Pre-Algebra Entering 8<sup>th</sup> Algebra 1



Dear Students and Parents,

Well, it's certainly been an interesting year! We have made the most of a difficult situation, turned challenges into opportunities, and accomplished so much together.

One of my goals is for each of you to develop a solid foundation for a successful transition to the pace and depth of Algebra 1. Important algebra-readiness skills include flexibility with integers and fractions, fluency with algebraic language, and understanding of properties used when solving equations. Successful Algebra 1 students are curious problem-solvers, willing to think, to reason, and to apply different strategies.

What did we learn this year? This packet has a page for each unit – from scale drawings to slope. Because these skills are a review of the year, you will find working on this packet will help you begin Algebra 1 feeling more confident. Your Algebra 1 journey will begin with an assumption you are proficient with these foundational skills and concepts.

I do not recommend calculators or SIRI (do you think I would?). Think about what the best strategy for the problem would be, and if it doesn't work, try again. Check to see if you have really answered the question and if your answers are reasonable. You have sharp number sense; don't forget to use it! If you kept up with creating folders in Notability, you will find you have lots of notes. While IXL may not be your favorite, I included a partial IXL reference list.

I know we all are going to enjoy a well-deserved break this summer! Even though this work will NOT need to be turned in when you return to school, I encourage you use this packet for an efficient way to fit a bit of review and practice into your summer schedule.

I am so proud of your efforts, mindset, attitude, and resilience during this tough year. By showing up and playing along, you made our classroom a great place for learning. Have a wonderful summer!

*Mrs. Matthews*

### IXL Level I and J References for Pre-Algebra Skills

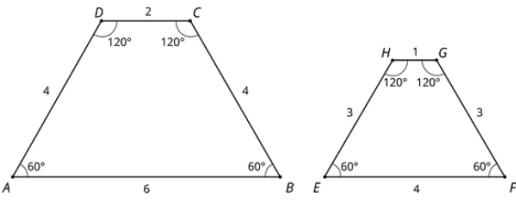
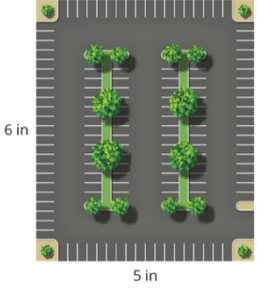
Scale and Proportional Relationships	IXL Level I, skills J9, J10; K1 - K8
Squares/Square Roots; Classify	IXL Level I, skills I8, I9; A10
Fraction Applications and Computation	IXL Level I, skills G1 - G18
Percent	IXL Level I, skills L1 - L10; M6 - M10
Algebraic Expressions	IXL Level I, skills R1 - R20
Solving One-Variable Equations	IXL Level J (not I) skills W1 - W14
Linear Equations in Two Variables	IXL Level I, skills U7, U8
Slope	IXL Level J (not I), skills Y1 - Y6

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SET 1 - SCALE DRAWINGS

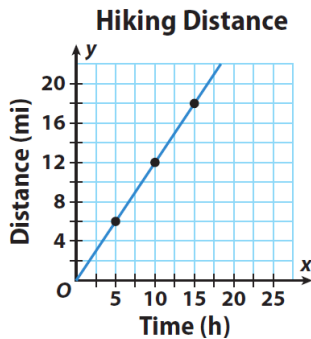
7<sup>TH</sup> Pre-Algebra Entering 8<sup>th</sup> Algebra

SKILLS: Scaled copies, scale factor, corresponding parts, units, actual to scale

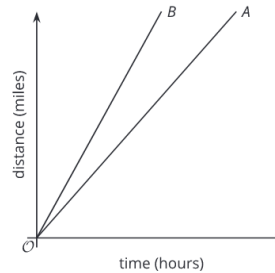
<p>Tell if these two polygons are scaled copies. Clearly explain your reasoning.</p> 	<p>A scale drawing of a rectangular parking lot is 6 in. long by 5 in. wide. The actual parking lot is 240 ft. long. What is the <b>area</b> of the <b>actual</b> parking lot in square feet?</p> 
<p>Rectangle A measures 8 in. by 2 in. Rectangle B is a scaled copy of Rectangle A. Select ALL the measurement pairs that could be the dimensions of Rectangle B.</p> <p>a.) 40 in. by 10 in.      b.) 10 in. by 2.5 in.</p> <p>c.) 9 in. by 3 in.      d.) 7 in. by 1 in.</p> <p>e.) 6.4 in. by 1.6 in.      f.) <math>\frac{2}{3}</math> ft. by <math>\frac{1}{6}</math> ft.</p>	<p>A rectangle measures 12 by 56 inches. A scaled copy has been made using a factor of <math>\frac{3}{4}</math>.</p> <p>a.) What are the dimensions of the scaled copy?</p> <p>b.) What is the perimeter of the original copy? Of the scaled copy?</p> <p>c.) If you want to scale the copy back to its original size, what scale factor should you use?</p>
<p>Select ALL the scales that are equivalent to 1 inch to 1 foot.</p> <p>a.) 1 to 12      b.) <math>\frac{1}{12}</math> to 1</p> <p>c.) 100 to 0.12      d.) 7 to 84</p> <p>e.) 9 to 108      f.) 36 to 3</p>	<p>A scale drawing of a truck has a scale of <math>\frac{3}{4}</math> inch to 5 feet. The length of the truck on the drawing is <math>10\frac{1}{2}</math> inches. What is the actual length of the truck?</p>

**SKILLS: Equal ratios, constant of proportionality, graph, equation  $y=kx$ , proportion situations**

Find the constant of proportionality from this graph and tell specifically what it means in this situation



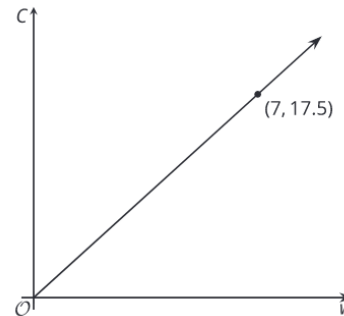
The two lines represent the distance, over time, two cars are traveling. Which car is traveling more *slowly*? Explain how you know.



**This graph shows the cost  $C$  in dollars of  $w$  pounds of peanuts, a proportional relationship.**

**Select ALL the true statements.**

- 17.5 pounds of peanuts costs \$7.00.
- The point (4, 10) is on the graph of the proportion.
- 1 pound of peanuts costs \$2.50.
- 15 pounds of peanuts cost \$25.50.
- 2.5 pounds of peanuts cost \$1.00
- $C$  is the dependent variable

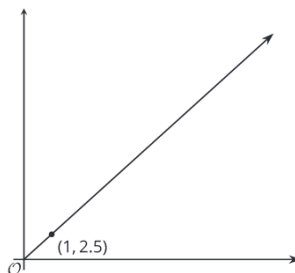


For this data set, tell if  $x$  and  $y$  are in a proportional relationship and why. If YES, write the equation in the form  $y=kx$  for the proportion.

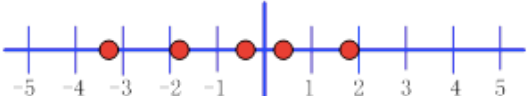
$x$	$y$
12	9
16	12
20	15

A smoothie recipe calls for 5 cups of strawberries for every 2 cups of bananas. The graph shows the relationship between strawberries and bananas.

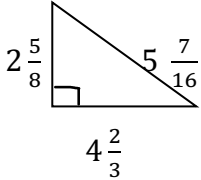
- a. Label the  $x$  and  $y$  axes appropriately.
- b. Write an equation for this proportion.
- c. Tell the meaning of the point (1, 2.5) in this situation.



**SKILLS: Rational/irrational; perfect/non-perfect squares; classifying; number lines/ordering**

<p><b>Give an example to fit the statement.</b></p> <p>a.) An integer that is NOT a whole number</p> <p>b.) An integer with a value less than <math>-\sqrt{80}</math></p> <p>c.) An irrational number greater than <math>-\sqrt{36}</math></p> <p>d.) A rational number than is NOT an integer</p>	<p>Write each fraction as a decimal. Use good strategies- simplify, friendly denominators - no long division. (No calculator.)</p> <p>a.) <math>\frac{21}{200}</math>                      b.) <math>\frac{110}{44}</math></p> <p>c.) <math>\frac{180}{120}</math>                      d.) <math>\frac{156}{24}</math></p>
<p><b>Approximate the irrational number <math>\sqrt{75}</math></b></p> <p>a.) <math>\sqrt{75}</math> is between the whole numbers _____ and _____ but closer to _____</p> <p>b.) Give a reasonable approximation of <math>\sqrt{75}</math> to one decimal place.</p>	<p>Compare these real numbers by filling in with <math>&gt;</math>, <math>&lt;</math>, or <math>=</math> (careful with negatives).</p> <p><math>\sqrt{90}</math> _____ 9</p> <p><math>-\sqrt{18}</math> _____ - 4</p> <p><math>\frac{10}{15}</math> _____ <math>\sqrt{\frac{100}{225}}</math></p>
<p>The expression <math>\sqrt{19 + x}</math> can be either rational or irrational, depending on the value of <math>x</math>.</p> <p>Give a value of <math>x</math> that would make the expression either rational or irrational. Show why.</p> <p>a.) <u>rational</u></p> <p>b.) <u>irrational</u></p>	<p>Of the four sets of numbers, circle the letter of the set that best describes the points shown.</p> <p>A) <math>-\sqrt{12}, -1.9, -0.3, 0.2, 1.8</math></p> <p>B) <math>-3, -1.9, -0.3, 1, \sqrt{10}</math></p> <p>C) <math>-3.2, -2.2, -0.3, \sqrt{2}, 2</math></p> <p>D) <math>-3, -\sqrt{5}, -0.3, 0.1, 2.4</math></p> 

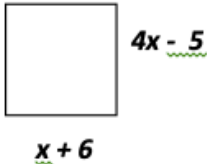
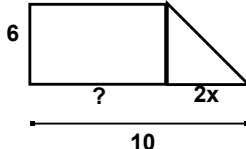
**SKILLS: Compute with negative and positive rational numbers. Order of operations. Apply algorithms efficiently; use number sense and reasoning as appropriate.**

<p>Simplify.</p> <p>a.) <math>-5\frac{1}{8} - 9\frac{5}{6}</math></p> <p>b.) <math>-6\frac{1}{4} + 2\frac{7}{8}</math></p>	<p>Find the perimeter and area of this right triangle. Measurements are in inches.</p> 
<p>Find the product or quotient.</p> <p>a.) <math>-\frac{8}{15} \div (-32)</math></p> <p>b.) <math>-3\frac{6}{7} \cdot 1\frac{13}{15}</math></p> <p>c.) <math>\frac{15}{25} \times \frac{30}{40} \times \frac{10}{20}</math> <i>simplify before you multiply!</i></p>	<p>Simplify the numerical expressions. Remember order of operations!</p> <p>a.) <math>90 - (12 \div 0.3) \div 2^3</math></p> <p>b.) <math>\left(-\frac{1}{2}\right)^2 - \left(-\frac{3}{4}\right) \cdot \left(\frac{2}{9}\right)</math></p>
<p>“If <math>a</math> and <math>b</math> are <i>positive</i> integers, then <math>a - b</math> MUST be a positive integer.” Is this correct? Support your answer with a number example.</p> <p>If <math>a</math> is a <i>negative</i> integer and <math>b</math> is a <i>positive</i> integer, tell whether the expression <math>a - b</math> represents a <i>positive</i> or a <i>negative</i> integer. Support your thinking with a number example.</p>	<p>Compare with <math>&gt;</math>, <math>&lt;</math>, or <math>=</math>. Use number sense and reasoning. <b>NO actual computation.</b></p> <p>a.) <math>\frac{1}{8} \div 2</math> _____ <math>\frac{1}{8} \div \frac{1}{2}</math></p> <p>b.) <math>\frac{1}{2} \times \frac{1}{2}</math> _____ <math>-\frac{1}{2} + \left(-\frac{1}{2}\right)</math></p> <p>c.) <math>-\frac{1}{3} + \frac{3}{4}</math> _____ <math>-\frac{3}{4} + \frac{1}{3}</math></p> <p>d.) <math>\frac{5}{6} \times \frac{2}{3}</math> _____ <math>\frac{2}{3}</math></p>

**SKILLS: Solve percent problems with parts and wholes; percent change**

<p>A pair of designer sneakers was purchased for \$120. Since you bought them, the price has increased 15%. What is the new price?</p> <p>If <math>x</math> is the price before the increase and <math>y</math> is the price after, which of these equations can be used to find the new price? Circle all that apply.</p> <p><math>y = 1.15x</math>                  <math>y = x + 0.15</math></p> <p><math>y = 0.15x</math>                  <math>y = x + 0.15x</math></p>	<p>Ralphie earns \$2400 each month. He spends 25% of his salary on food, 40% of his salary on rent, and 10% on student loans. He puts 20% <b>of what's left</b> in his savings account. How much does he put into his savings account?</p>
<p>A laptop's original price is \$800. It is on sale for 25% off. The sales tax rate is 8.5%. How much did I pay for the laptop?</p>	<p>This month a club has 72 members. This is a 50% increase from the number of members in the club last month. How many members were in the club last month?</p>
<p>The amount of water in a bottle is reduced by 85% to 120 milliliters. How much water was originally in the bottle? Support your thinking.</p>	<p>Find the new amount after the percent increase or decrease. Support your thinking.</p> <p>a.) Increase 4.2 by 30%</p> <p>b.) Decrease 80 by 65%</p>

**SKILLS: Translate, simplify, distribute, factor, write expressions to solve problems**

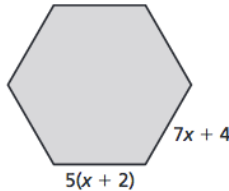
<p>Simplify the expressions.</p> $-3(x - 6) + 8x - 2 + 5.25$ $-3.6\left(x - \frac{1}{2}\right) - 7 + 5x$ $4(0.2x - 0.3) - (2x - 1)$	<p>Factor these expressions completely.</p> $3x + 57y + 15$ $-12x - 16y$ $55x + 11y + 132z$
<p>Identify the parts of this expression.</p> $-a - 3b + 2c + 4$ <p>coefficients:</p> <p>constants:</p> <p>how many terms?</p> <p>how many variables?</p>	<p>First, write an <i>expression</i> for the <u>perimeter</u> of this rectangle; then simplify your expression.</p> 
<p>Translate into an algebraic expression.</p> <ul style="list-style-type: none"> <li>• A number <math>n</math> increased by 3%</li> <li>• A number <math>n</math> decreased by 25%</li> <li>• <math>\frac{1}{4}</math> of the sum of <math>x</math> and 11</li> <li>• The sum of <math>\frac{1}{4}x</math> and 11</li> <li>• Two less than one-half <math>x</math></li> </ul>	<p>Write an expression for the missing measurement. Then write and simplify an expression for the <u>area</u> of this polygon.</p> 



SET 7 - EQUATIONS

7<sup>TH</sup> Pre-Algebra Entering 8<sup>th</sup> Algebra

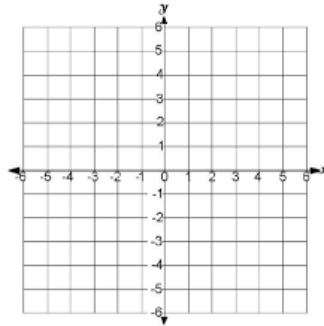
**SKILLS:** Understand solutions of equations as the variable that makes the equation true. Apply properties of equality to solve multi-step equations with proper steps.

<p>Circle the equation NOT equivalent to</p> $\frac{1}{8}(4x - 5) = -3$ <p><math>4x - 5 = -24</math>      <math>x = -\frac{19}{4}</math></p> <p><math>\frac{1}{2}x - \frac{5}{8} = -3</math>      <math>4x - 5 = -\frac{3}{8}</math></p>	<p>Solve the equation.</p> $\frac{2}{3}(3x - 9) = -36$
<p>Solve the equation.</p> $\frac{7}{8} - \frac{1}{4}x = \frac{1}{2}x - \frac{1}{4}$	<p>Solve the equation.</p> $13x - (x + 7) = 29$
<p>Write and solve an equation to find the value of <math>x</math>; then find the side length of this regular hexagon.</p> 	<p>The cost of seeing a weekday show is 75% of the cost of a weekend show. Last month on vacation, Megan saw 4 weekday shows and 3 weekend shows. She spent \$90 in all. Write and solve an equation to find the price of a weekend show.</p> <p>Let the variable <math>x</math> stand for weekend show price.</p>

**SKILLS:** Graph equations in two variables; the concept of slope as the ratio of vertical change to horizontal change; slope from graphs, points; slope-intercept form of a linear equation.

Make a table of values following our guidelines. (Choose 3 values for  $x$ : pos, zero, neg.) Then graph.  $y = -\frac{1}{3}x + 4$

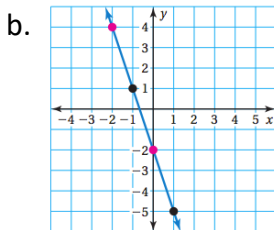
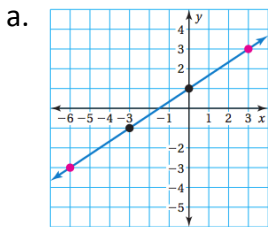
$x$	$-\frac{1}{3}x + 4$	$y$



Find the slope of the line passing through the pair of points. No graph; support your answer with slope formula. (Ratio of change in  $y$  over change in  $x$ )

$(-2, 3)$  and  $(-4, -1)$

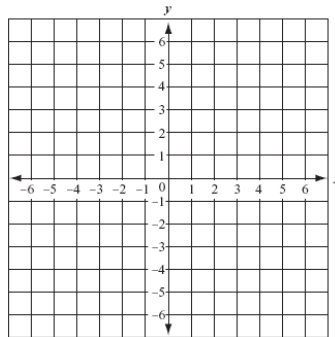
Find the slope of each line from the graph.



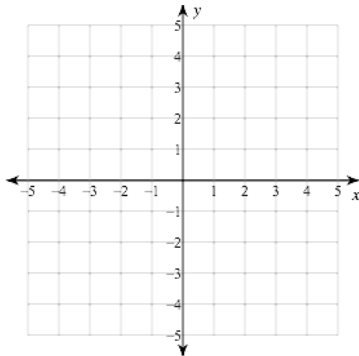
Write the slope and the  $y$ -intercept.

Then graph the equation.  $y = -2x + 3$

slope: \_\_\_\_\_  $y$ -intercept: \_\_\_\_\_



Graph the line passing through  $(-3, -4)$  with a slope of  $3/4$ . How? Graph the point. Then “use” the slope to go up and over to the next point.



Sketch (just sketch, no equation or points) a line with a positive slope and a negative  $y$ -intercept. Through which three quadrants does it pass?

