Summer Math Review for Students Entering Pre-Algebra

Hello Students!

As you prepare for seventh grade, reviewing the skills you have learned in lower school is incredibly valuable. This math packet is a compilation of exercises that include examples demonstrating methods to solve the problems. To best prepare for your math class this fall, it is recommended that you work on a small section of this packet each week.

Here are the directions:

- Put your name on each page.
- Read the directions and (if relevant) look at the sample problem before beginning each set.
- Do NOT use a calculator for this packet.
- Show your steps and work for each problem. You must show work completely and neatly for full credit. If you need additional space, please use a separate sheet of paper and staple it to your summer review.
- Simplify answers and include units whenever necessary.
- Write all answers on the answer sheet provided.

This packet will be graded as a quiz grade for your seventh-grade class. It is due in class on the first day of school.

Summer Math Review Answer Sheet

Name: _____

Complete with final answer only. Work to be completed in packet or on separate sheet of paper. Answers will only be graded with completed work.

Prime Factorization / GCF / LCM

PF1: _____

PF2: _____

PF3: _____

GCF1: _____

GCF2: _____

GCF3: _____

LCM1: _____

LCM2: _____

LCM3: _____

Word 1: _____

Word 2: _____

Integer Operations

1: _____

2: _____

3: _____

4: _____

5: _____

6: _____

7: _____

8: _____

9: _____

10: _____

11: _____

12: _____

13: _____

14: _____

15: _____

16: _____

17: _____

18: _____

19: _____

Decimal Operations

1: _____

2: _____

3: _____

4: _____

5: _____

6: _____

7: _____

8: _____

9: _____

10: _____

11: _____

Fraction Operations

1: _____

2: _____

3: _____

4: _____

5: _____

6: _____

7: _____

8: _____

9: _____

10: _____

11: _____

12: _____

13: _____

Fractions / Decimals / Percents - Complete the chart directly in the packet

Percents & Comparisons

C1: _____

P1: _____

P2: _____

P3: _____

P4: _____

P5: _____

C2: _____

C3: _____

C4: _____

C5: _____

C6: _____

Rates & Ratios

1a: _____

1b: _____

1c: _____

1d: _____

2: _____

3: _____

4: _____

Coordinate Plane – Plot points within packet. Mark answers for questions below

1: _____

2: _____

3: _____

4: _____

5: _____

Order of Operations

1: _____

2: _____

3: _____

4: _____

5: _____

6: _____

7: _____

8: _____

9: _____

Simplifying Expressions

1: _____

2: _____

3: _____

4: _____

5: _____

6: _____

7: _____

8: _____

9: _____

Evaluate Expressions

1: _____ 3: _____

2: _____

Solve Equations

1: _____ 4: _____

2: _____ 5: _____

3: _____ 6: _____

Write Equations / Inequalities

1: _____ 4: _____

2: _____ 5: _____

3: _____ 6: _____

Word Problems / Geometry / Statistics

Alg WP1: _____ Geom4: _____ Stats2-1: _____

Alg WP2: _____ Geom5: _____ Stats2-2: _____

Geom1: _____ Mean: _____ Stats3-1: _____

Geom2: _____ Median: _____ Stats3-2: _____

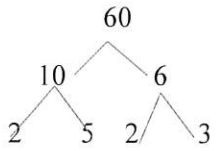
Geom3P: _____ Mode: _____ Stats3-3: _____

Geom3A: _____ Range: _____

Prime Factorization

To write a number in prime factorization, express it as a product of prime numbers. Continuously divide factors of the given number until only prime numbers remain. Then write the final product. You can use a factor tree or factor ladder to break a number into its prime factors.

Sample: *Write the prime factorization of 60.*



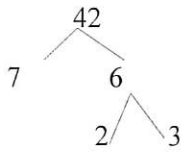
$60 = 2^2 \cdot 3 \cdot 5$

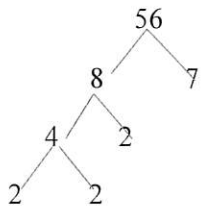
Write the prime factorization of each number		
1. 75	**2.** 56	**3.** 810

Greatest Common Factor

To find the greatest common factor (GCF) of two numbers, identify the largest possible factor both numbers have in common. You can do this by writing out the prime factorization of both numbers. Then identify the common prime factors shared by both numbers. Then multiply those common prime factors together.

Sample: Find the GCF of 42 and 56.





$42 = 2 \cdot 3 \cdot 7$

$56 = 2^3 \cdot 7$

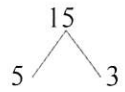
$GCF = 2 \cdot 7 = 14$

Find the GCF of each set of numbers.		
1. 64 and 48	**2.** 72 and 156	**3.** 45 and 108

Least Common Multiple

To find the least common multiple (LCM) of two numbers, identify the smallest number that is a multiple of each. You can do this by finding the prime factorization for each number. Then identify each prime factor the maximum number of times it appears in any factorization and multiply these factors together.

Sample: Find the LCM of 15 and 25.



$LCM = 5 \cdot 5 \cdot 3 = 75$

Find the LCM of each set of numbers.		
1. 18 and 30	**2.** 24 and 40	**3.** 12 and 28

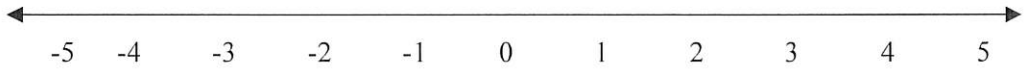
Solve the following problems using either GCF or LCM to help you.

1. Victoria is stacking 10-inch boxes while Soren is stacking 12-inch boxes. They plan to stop stacking when their towers are the exact same height. At what height will this occur?

2. Benjamin has 80 green marbles and 32 orange marbles. He is dividing them into groups, and he wants each group to have the same combination of green marbles and orange marbles. What is the most groups he can divide his marbles into if he wants to have no marbles leftover? How many green marbles and orange marbles will be in each pile?

Integer Operations

A number line shows number relations. Numbers to the left are less than numbers to the right.



1. Order from least to greatest; then plot the following values on a number line below.

7, 0, 2, 3, -2, 1, -3

2. Order from least to greatest, and then plot the following values on a number line below.

-2.75, 3, 3.5, -2, $-4\frac{1}{2}$, 5.2, 0, $3\frac{1}{3}$, 5

Find each sum or difference.

3. $5 + 2 =$	**4.** $5 + (-2) =$	**5.** $8 + (-2) =$
6. $-3 + 4 =$	**7.** $-5 + 5 =$	**7.** $10 - (-2) =$
8. $-4 - 9 =$	**9.** $-4 - (-9) =$	**10.** $-17 + 21 =$

Find each product or quotient.

11. $12 \times (-3) =$	**12.** $-7(-9) =$	**13.** $-21(4) =$
14. $-11 \times (-11) =$	**15.** $-75 \div 5 =$	**16.** $(-96) \div (-12) =$
17. $81 \div (-3) =$	**18.** $\frac{-27}{3} =$	**19.** $\frac{-84}{-7} =$

Decimal Operations

Evaluate. Show work and give your final answer in decimal form.		
1. $6.27 - 6.059$	**2.** 7.05×2.51	**3.** $51.3 \div 0.9$

4. $0.165 + 3.243$	**5.** $5.026 + 0.42$	**6.** $0.2479 - 0.016$
7. 0.463×0.12	**8.** 7.99×2.53	**9.** $106 \div 0.8$
10. $726 \div 0.6$	11. A taxi service charges \$1.20 per mile. If Titus paid \$16.38 for a ride to the airport, how many miles was the trip?	

Fractions

Convert all mixed numbers to improper fractions before solving. When adding and subtracting fractions, first ensure both fractions have a common denominator. When multiplying and dividing fractions, use cross-simplification before multiplying and dividing.

Evaluate. Show work and give your final answer in simplest form as a mixed number if necessary.		
1. $\frac{7}{12}+\frac{3}{2}$	**2.** $\frac{10}{24}\times\frac{3}{5}$	**3.** $2\frac{1}{3}\div\frac{21}{12}$

4. $\frac{3}{8}+\frac{15}{16}$	5. $\frac{8}{10}+\frac{9}{15}$	**6.** $2\frac{1}{7}-\frac{3}{21}$
7. $\frac{4}{5}\times\frac{2}{3}$	**8.** $\frac{18}{25}\times\frac{5}{36}$	**9.** $1\frac{1}{2}\times\frac{10}{27}$
10. $\frac{3}{8}\div\frac{15}{16}$	**11.** $\frac{7}{13}\div\frac{7}{9}$	**12.** $4\frac{2}{3}\div\frac{7}{15}$
13. A trail that wraps around a lake is $1\frac{7}{8}$ miles long. If Joshua has run $\frac{4}{5}$ of the distance of the trail around the lake, how far has he run?		

Fractions vs. Decimals vs Percents: Complete the chart below:

	FRACTION	DECIMAL	PERCENT
1.	$\frac{7}{25}$		
2.	$\frac{9}{5}$		
3.	$\frac{1}{8}$		
4.	$\frac{5}{12}$		
5.		0.325	
6.		2.1	
7.		0.78	
8.			87.5%
9.			135%
10.			4%

Percents

Find the percent of each number.		
1. 70% of 60	**2.** 35% of 140	**3.** 4% of 275
4. 325% of 40	**5.** There are 180 days in a school year. If a math teacher tells her students they have completed 65% of the school year, how many days are left in the school year?	

Comparing Fractions, Decimals, and Percents

Convert to compare the following values. Then compare by placing <, >, or = between the values.		
1. 110% and 0.975	**2.** $\frac{13}{20}$ and 18%	**3.** $\frac{3}{25}$ and $\frac{2}{10}$
4. 120% and $1\frac{1}{5}$	**5.** $\frac{17}{20}$ and $\frac{5}{6}$	**6.** 9% and $\frac{7}{40}$

Rates and Ratios

1. Fill in the missing term in each pair of equivalent ratios.

a) $1 : 3 = 6 :$ ____ **b)** $\frac{25}{15} = \frac{\quad}{3}$ **c)** $\frac{4}{\quad} = \frac{20}{35}$ **d)** _____ $: 36 = 21 : 12$

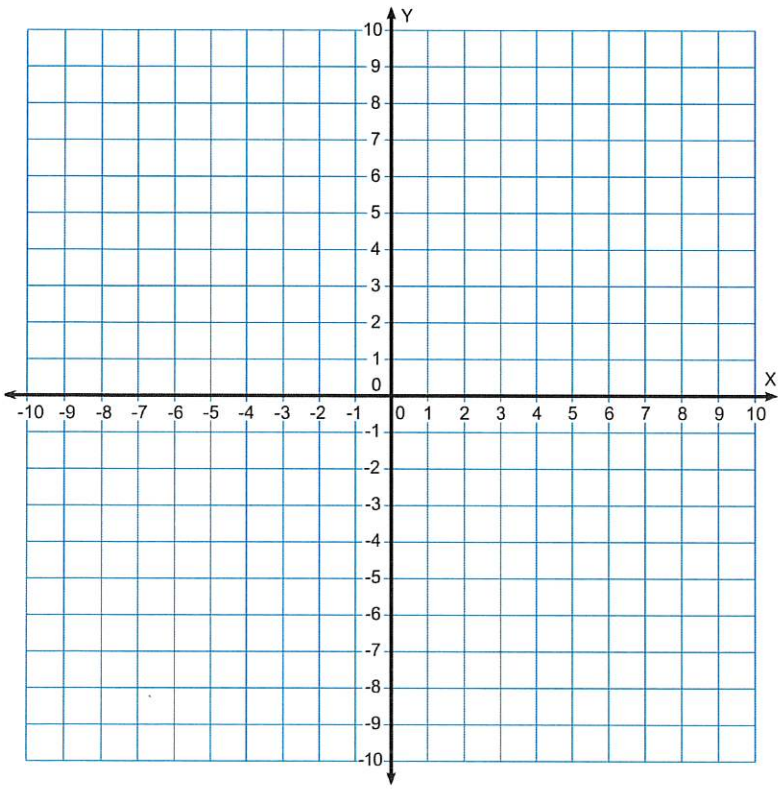
2. Peter wants to mix up some punch for his party. For every 3 cups of ginger ale, he mixes in 2 cups of cranberry juice. If he uses 15 cups of ginger ale, how many cups of cranberry juice does he use? Write a ratio to show your work.

3. It takes 15 minutes to fill a 165-liter bathtub. Find the unit rate of liters per minute to fill the bathtub.

4. There are 12 girls and 6 boys in a sixth grade class. The ratio of girl violinists to boy violinist in the class is the same as the ratio of girls to boys in the class. If 4 girls play violin, how many boys play violin?

The Coordinate Plane

Plot the given groups of points on the coordinate plane below. Then join the points for that group in order with line segments to form a closed figure. Name each figure formed. Use a different color pencil for each problem.



1. A (3, 4), B (-6, -3), and C (2, -4) form a _____.
2. D (-3, 0), E (0, 5), and F (3, 0) form a _____.
3. J (3, 2), K (-1, 2), L (-1, -2), and M (3, -2) form a _____.
4. W (2, 1), X (-1, -3), Y (4, -3), and Z (7, 1) form a _____.
5. P (-5, -2), Q (-6, -5), R (-1, -5), and S (-3, -2) form a _____.

Order of Operations

Simplify each of the expressions below. Show your steps. Use PEMDAS to complete in the correct order and work vertically

Reminder: PEMDAS or GEMDAS stands for:

- Parentheses or Grouping symbols or Division Bar
- Exponents
- Multiply or Divide working from left to right
- Add or Subtract working from left to right

Examples:

1. $7(12 - 8)$ $7(12) - 7(8)$ $84 - 56$ 28	**2.** $\frac{15 + 6 \div 2}{9} + 10$ $\frac{15+3}{9} + 10$ $\frac{18}{9} + 10$ $2 + 10$ 12

Evaluate using order of operations.

1. $3 + 5 \times 7$	**2.** $4(10 + 6)$	**3.** $8 - (16 + 8) \div 8$
4. $17 - \frac{14 + 7}{3}$	**5.** $\frac{14 - 5 \times 2}{2} + 10$	**6.** $3(2 + 7) - 5(10 \div 2)$

7. $3^2 - (1 + 7) + 6$	**8.** $\frac{1}{2} + 16 \div 8 \times 4$	**9.** $(13 - 3)^2 \div 5 \times 3$

Simplifying and Evaluating Algebraic Expressions

Sample: To simplify an expression, follow the order of operations and combine like terms.

1) $7x + 17 + 3 - 2x$

$7x - 2x + 17 + 3$

$5x + 20$

2) $8(2 - 6y)$

$8(2) - 8(6y)$

$16 - 48y$

Simplify each expression completely		
1. $10x + 9 + x$	**2.** $5y - 4 + 2y$	**3.** $11 + z - 4 + 3z$
4. $5(y + 4)$	**5.** $2(9 - t)$	**6.** $\frac{1}{2}(4 - 2b)$
7. $13 + 5(2m - 2)$	**8.** $7(x + 3) - 8$	**9.** $3(2a + 3) - 2(a + 2)$
Evaluate each expression using the given variable values.		
1. $2p + 9$ if $p = 4$	**2.** $\frac{1}{3}(2b + 1)$ if $b = 7$	**3.** $y^2 + 2(y + 4)$ if $y = 4$

Solve each equation. Show all work and check your solutions.		
1. $2w + 8 = 24$	**2.** $61.3 = 5.2 + y$	**3.** $z - \frac{1}{5} = \frac{5}{6}$
4. $\frac{4}{5}x = 8$	**5.** $1\frac{7}{9} = \frac{5}{6}m$	**6.** $c \div \frac{12}{5} = 2\frac{7}{10}$

Creating Algebraic Expressions, Equations and Inequalities.

Write each of the following sentences as an algebraic equation or inequality. Do not solve.		
1. The sum of a number and 15 is equal to 32.	**2.** 16 is greater than the sum of 11 and a number.	**3.** The difference of a number and 8 is greater than 21.
4. 60 is less than or equal to the product of 6 and another number.	**5.** A number divided by 3 is equal to at least 21.	**6.** 9 added to the product of a number and 2 is equal to 25.

Write an algebraic equation for each problem and then solve.

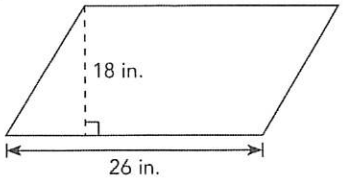
1. Miriam has 5 times as many stickers as Katie. If Miriam has 325 stickers, how many stickers does Katie have?

2. If a number is multiplied by 4, it gives the same result as $\frac{2}{7}$ of 504. What is that number?

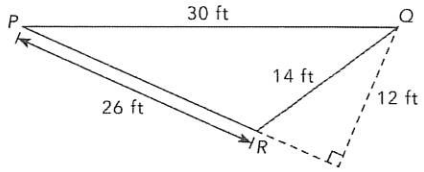
Perimeter and Area and Volume

1. The width of a rectangle is 9 inches and its length is 11 inches. What is its perimeter?

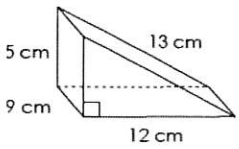
2. Find the area of the parallelogram.

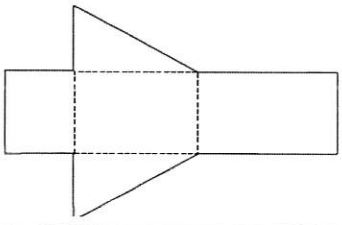


3. Find the perimeter and area of the triangle.

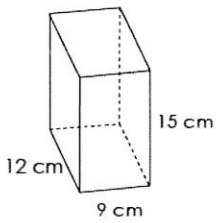


4. Find the surface area of the figure using the given net.





5. Find the volume of the rectangular prism.



Statistics

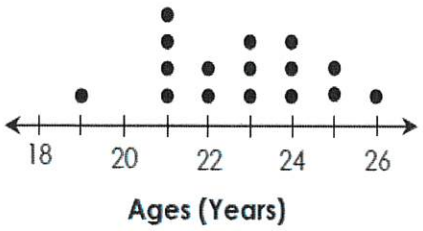
1. Find the mean, median, mode(s), and range for the following data:

High temperature for the past nine days: 57, 61, 57, 58, 58, 57, 61, 54, 68

Mean: _____ Median: _____ Mode(s): _____ Range: _____

2.

The ages of the players on a hockey team are shown below.

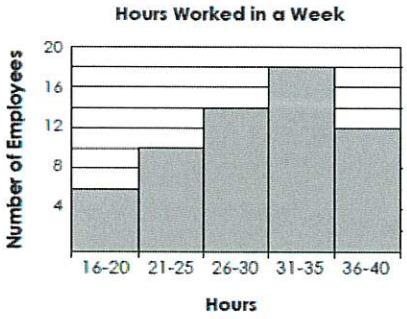


1. Compare the median and mode ages.

2. How many players are no more than 24 years old?

3.

The histogram below shows the number of hours worked in a single week by each employee at a company.



2. How many employees worked 30 hours at most?

3. What percent of the employees worked between 16 and 20 hours?

4. What percent of the employees worked a minimum of 26 hours?