

Summer Homework Packet

Incoming 8th Grade

Dear Parents/Guardians and Students,

Throughout the summer it is very important to review topics from previous mathematics grade levels. The problems in this packet are designed to help you review and work on skills to be a successful 8th grade math student. This packet will count as a homework grade and these topics will appear on a quiz at the beginning of the marking period (after a review is completed).

The summer homework packet is due Friday, September 6, 2019. In order to receive full credit for the summer homework assignment, all work must be shown (homework does not have to be 100% correct to receive full credit; it needs to be completed to the best of your ability and on time). There are two additional worksheets attached to the packet that are extra credit. These two pages do not have to be completed; however any student that completes them and shows their work will receive extra credit.

Have a wonderful summer!

Mrs. Sokolowski

Objectives for 8th Grade Summer Packet

- I. Order of Operations (Problems #1- 5)
 - * Evaluate expressions using the order of operations
 - * Evaluate expressions inside parentheses or brackets
 - * Simplify exponents
 - * Use all operations
- II. Integers (Problems #6-10)
 - * Add, subtract, multiply and divide integers
 - * Determine the absolute value of an integer
- III. Evaluating Algebraic Expressions (Problems # 11-15)
 - * Use order of operations to evaluate real number expressions
 - * Substitute given value and solve
- IV. Fractions, Decimals, and Percents (Problems # 16-20)
 - * Perform all operations with decimal numbers
 - * Express fractions as terminating or repeating decimals
 - * Add mixed numbers
 - * Express fractions in simplest form
- V. Percents (Problems # 21-25)
 - *Find the percent of a number
 - *Convert percents to decimals
 - *Convert fractions to decimals and percents
- VI. Ratios and Proportions (Problems #26-30)
 - * Express ratios as fractions
 - * Simplify fractions and ratios
 - * Write and solve proportions
 - * Determine unit rates
 - * Similar Polygons
- VII. Analyzing Data: Mean, Median, Mode and Range (Problems # 31 – 35)
 - *Calculate mean, median, mode, and range in a variety of situations
- VIII. Coordinate System and Transformations (Problems # 36- 40)
 - * Name the quadrant of an ordered pair
 - *Reflection, translation, and rotation of a polygon
- IX. Geometry (Problems # 41-45)
 - *Identify angles as acute, obtuse, right and straight
 - *Classify complimentary and supplementary angles
 - *Determine equilateral and equiangular polygons
 - *Find a missing length in a pair of similar polygons
 - *Find the sum of the measures of the angles in a polygon
- X. Perimeter, Area, and Volume (Problems # 45-50)
 - *Find perimeter, area, and volume of various shapes

Order of Operations

Directions: Complete each problem showing all work. You must show work or explain your solution in order to receive credit for the answer. Circle your answer.

Follow the order of operations to evaluate the following expressions. (PEMDAS)

1. $25 - 5 + 4 - 3$

2. $5 \times 8 - 3 \times 4$

3. $47 - 4(5 - 3)$

4. $16 - 4 + 3^2 \times 2 - 5$

Hint: Exponents tell how many times the base is used as a factor.

Insert parentheses to make the following sentence true.

5. $4 \times 5 + 16 - 2 = 82$

Integers

Compute the following:

6. $-18 + (-45) + 12$

7. $h = 13 - (-10)$ Find h

Hint: To subtract an integer, add its additive inverse. (“change/change”) To add integers with different signs, take the sign of the “larger” number.

8) $(-4)(-7)(-11)$

9. $-168 \div 4$

10. During the month of January, temperatures can decrease by 20° per week. If this happens and the temperature on January 12th was 12° , what is the temperature on January 19th.

Evaluating Algebraic Expressions

For # 11-15, evaluate the expression if $a = -8$, $b = 2$, $c = -5$, and $d = 6$

11. $-2cd$

Hint: When no operation is indicated it is implied to be multiplication

12. $a^2 - b$

Hint: Exponents tell the number of times the base is used as a factor.

13. $b(a+d)$

14. $\frac{ac}{b-d}$

15. $|a+b|$

Hint: The absolute value of an integer is its distance from zero on a number line.

Fractions and Decimals

16. $25 - (14.1 + 3.9)$

Hint: Line up the decimal points

17. $(1.35)(.0007)$

18. The fastest Monarch butterfly can fly $\frac{1}{3}$ mile per minute. Express $\frac{1}{3}$ as a decimal.

Hint: Divide the numerator by the

Denominator to get a decimal. Use bar notation for repeating decimals.

19. $4\frac{1}{2} \times 2\frac{1}{3}$

Hint: Change mixed numbers to improper fractions.

20. $2\frac{3}{4} + 3\frac{3}{5}$

Hint: Find the least common denominator. Simplify.

Percents

21. What is 3% of 156?

Hint: Change the percent to a decimal
“Of” means multiply

22. Some friends are sharing pizza. If each person gets $\frac{1}{8}$ of the pizza, what percent of the pizza does each person get?

Hint: A percent is another way of writing a fraction whose denominator is 100.
Set up a proportion

23. Bailey went out to dinner. It cost \$ 45.00. He wanted to leave a 20% tip for his waitress. Find the tip.

Hint: Tip is a percentage “of” the bill.

24. Jack hit the ball 9 out of 15 times. Find the percent that Jack hit the ball.

Hint: Make a fraction first.

25. Jackie bought an iPhone for \$200. Find the **total cost** including a 7% sales tax.

Hint: Tax is a percentage “of” the bill
Total cost = Original Cost + tax

Ratio and Proportion

Directions: Solve the following. Be sure to label with the proper units.

26. Simplify the following ratios:

Hint: Compare same units of measure

- a) 3 feet to 8 inches b) 30 cm to 2 meters

27. Solve for x: $\frac{5}{9} = \frac{x}{5.4}$

Hint: Product of the extremes = product of the means

28. On our vacation, we traveled 416 miles using 16 gallons of gas? How many miles were we able to go on 1 gallon of gas?

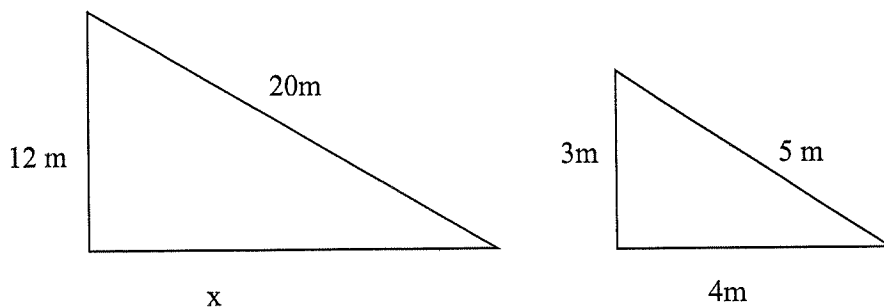
Hint: Find the unit rate

29. The ratio of boys to girls in the 8th grade is 5:6. If there are 75 boys in the 8th grade, how many are girls?

Hint: Set up a proportion of two ratios comparing girls to total students. (add the ratio numbers to get a ratio total.)

30. The triangles below are similar. Find the value of x.

Hint: Set up a proportion.



Analyzing Data- Mean, Median, Mode and Range

Directions: Use the given set of data for questions 36 to 38.

56, 65, 57, 75, 76, 66, 65, 64

31. Find the mean of the data given above.

Hint: The mean is the average.

mean _____

32. Find the median of the data given above.

Hint: The median is the middle number when the set of numbers are in order.

median _____

33. Find the mode and the range

Hint: The mode is the number that occurs the most. The range is the difference between the highest and lowest number.

mode _____ range _____

Use the following chart to answer the question below.

Student	Test 1	Test 2	Test 3	Test 4	Test 5
Colleen	93	86	84	78	85
Lakesha	83	85	93	58	86

34. What is the mean of ALL the test scores?

35. If test 4 is removed, how will this change the mean and why?

Coordinate System and Transformations

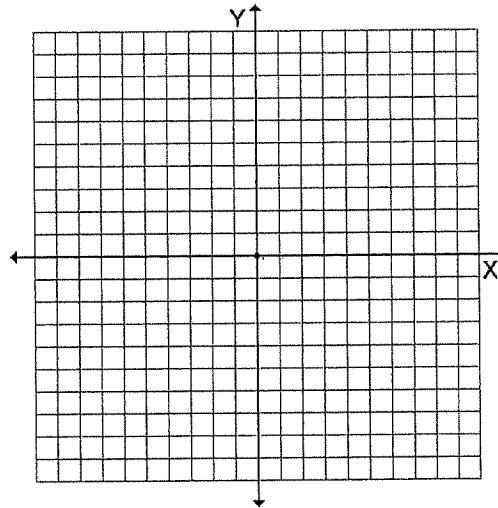
36. In which quadrant is the ordered pair $(-2, -3)$?

Hint: The 1st Quadrant is the top right and then follow counter clockwise.

37. Explain why the point A $(-7, 10)$ is different from the Point B $(7, -10)$.

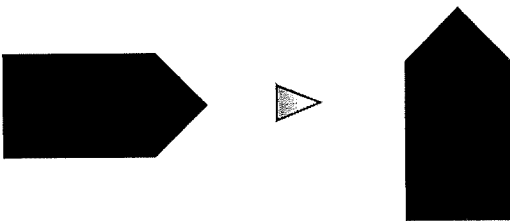
38. Triangle RST has vertices R $(2, 1)$, S $(5, 3)$, and T $(3, 4)$. Graph the triangle given above, then reflect it across the y-axis.

Hint: Reflection is a flip.



39. What type of transformation is shown in the figure below?

Hint: Is it a reflection (flip), translation (slide), or a rotation (turn)?



40. When playing chess, you can move the game pieces up or down, left or right, or diagonally. What type of transformation is used in this game? Give reasons for your answer.

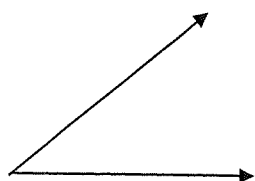
Hint: Same as # 39

Geometry

41. Classify each angle as acute, obtuse, right, or straight.

Hint: Look up definitions of each type of angle.

a.



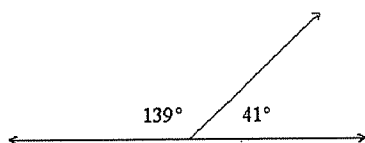
b.



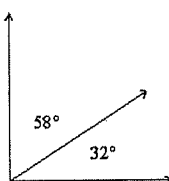
42. Classify each pair of angles as supplementary or complementary.

Hint: Look up definitions of each term.

a.



b.



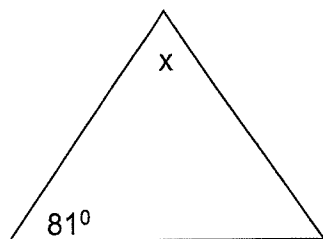
43. If a polygon is equilateral, its sides are congruent.
If a polygon is equiangular, its angles are congruent.
Draw an example of a quadrilateral that is equilateral but not equiangular?

Hint: Congruent means equal.

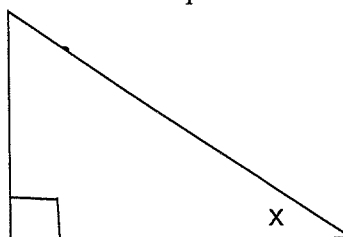
Find the measure of the missing angle:

Hint: The sum of the angles of a triangle equals 180° .

44.



45.



Perimeter, Area, and Volume

Solve the following problems. Label the correct units of measure. Hint: Draw the picture & Use the reference card.

46. Find the area of a square whose perimeter is 80 inches.

Hint: Find the measure of each side first.

47. Find the volume of a tissue box whose length is 9 inches, width is 4 inches and height is 3 inches.

Hint: A tissue box is a rectangular prism

48. Sally was on the boardwalk and purchased a really large ice cream cone. It had a radius of

Hint: Find the volume of a cone.

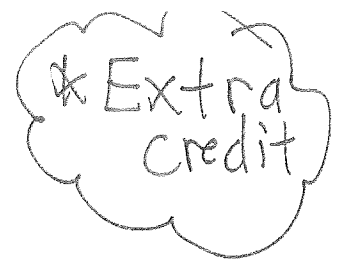
3 inches and a height of 6 inches. If the cone was completely filled with ice cream, with no extra ice cream on top, how many cubic inches of ice cream did Sally have? Let $\pi = 3.14$

$$V = \frac{1}{3}h\pi r^2$$

49. Mary wants to put a fence around her circular garden. The diameter of her garden is 12 feet. Find the distance around Mary's garden. Let $\pi = 3.14$

Hint: $C = \pi d$

50. The width of a rectangle is 7 inches and the length is 13 longer than the width. Find the perimeter of the rectangle.



Solve Two-Step Equations

Solve each equation. Check your solution.

1. $4h + 6 = 30$

2. $\frac{2}{7}y + 5 = -9$

3. $-3t + 6 = 0$

4. $-8 + 8g = 56$

5. $5k - 7 = -7$

6. $19 + 13x = 32$

7. $-\frac{1}{5}b - \frac{2}{5} = -2$

8. $1n + 1 = 11$

9. $\frac{3}{4}f + 5 = -5$

10. $5d - 3.3 = 7.2$

What's Not to Like?

*Extra Credit

Simplify each expression by combining like terms. Circle the expression in each problem that does not belong. Place the letter above the problem number below.

1. A. $5t + 3r + 9t - 10r$

E. $r + t - 8r + 13t$

I. $-r + 4t + 10t + 8r$

2. D. $12x - 3y + x + 2y$

E. $3(4x - 3y) + x + 3y$

F. $4(4x - 2y) - 3x + 7y$

3. E. $4(y - 7x) - y$

I. $-30x - (2x)$

O. $-7(4x + y) + 7y$

4. U. $6(x - y) - 3(3x + y)$

V. $3(3x - y) - 6y$

W. $4x + y - 7x - 10y$

5. Q. $3(r - 1) - 4r + 5$

X. $2(3 - 2r) - 4(2 - r)$

Z. $-r + 7 + 3r - 9 - 2r$

6. L. $8(x + y) + 3(x + y)$

M. $10(x + y) + x + y$

N. $9(x + y) - 2(x + y)$

7. A. $3(2b - a) - (2a - b)$

B. $3(a + 2b) - (b + 2a)$

C. $2(a + 2b) - (a - b)$

8. I. $5(a - b) - 2(a - b) + 8(a - b)$

U. $6(a - b) - 4(a - b) + (a - b)$

O. $(a - b) - (a - b) + (a - b)$

9. R. $3(x - y) - 2(y - x)$

S. $2(x - y) - 3(y - x)$

T. $3(y - x) - 2(x - y)$

10. L. $-4(x + 2(5xy - x))$

M. $-4(x + 5(3xy + x))$

N. $-2(3x + 3(10xy + 3x))$

Two expressions in each problem are

2 5 8 1 4 7 10 3 6 9