

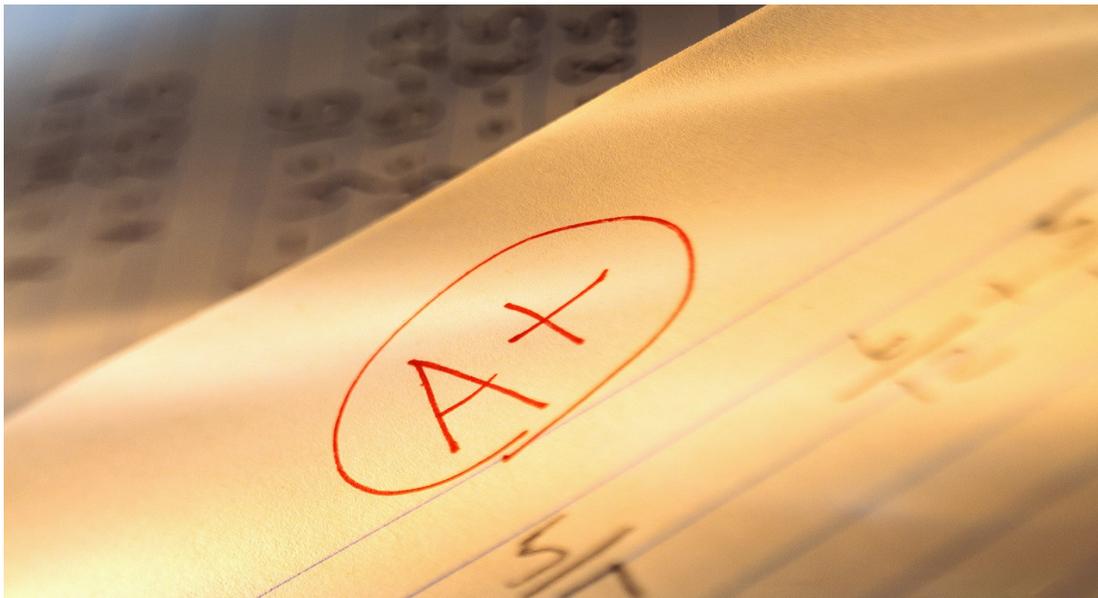
# Summer Math Packet

Manchester Public Schools

Given to Sixth Graders in June

Going to Seventh Grade Pre-Algebra

2016



Name \_\_\_\_\_

School \_\_\_\_\_

\_\_\_\_\_

(Parent Signature)





4. At Books Plus, 4 paperback books cost \$28. What would 9 books cost? How many books could be purchased with \$77? Show your work here.

5. The ratio of cups of lemonade juice concentrate to cups of water in punch is 1: 2. If Jillian made 36 cups of punch, how many cups of lemonade did she need? Show your work here.

6. Using the information in the table, find the number of feet in 4 yards.

Feet	3	6	9	?
Yards	1	2	3	4

Show your work here.



7. Compare the number of black circles to white circles. If the ratio remains the same, how many white circles will there be if there are 80 black circles?



Black	4	40	20	60	80
White	3	30	15	45	?

Show your work here.

8. In Chex mix, the ratio of cups of Chex to cups of chocolate candies is 4 to 1. How many cups of chocolate candies would be needed for 8 cups of Chex. Show your work here.

9. If flank steak costs \$4.25 per pound, how much does 0.8 pounds of flank steak cost? Explain how you determined your answer.





14. How many centimeters are in 8 feet, given that 1 inch  $\approx$  2.54 cm? Show your work here.

### The Number System

15. The balance in Sabrina's checking account was  $-\$5.43$ . The balance in Joe's checkbook was  $-\$10.25$ . Write an inequality to show the relationship between the amounts. Who owes more? Show your work here.

16. Samantha has  $\frac{2}{3}$  of an hour left to make cards. It takes her about  $\frac{1}{6}$  of an hour to make each card. About how many can she make? Model your answer on the number line.





17. Isaiah has  $\frac{3}{4}$  cup of brownie mix. Each brownie uses  $\frac{1}{8}$  cup of brownie mix. How many brownies can Isaiah make? Show your work here.

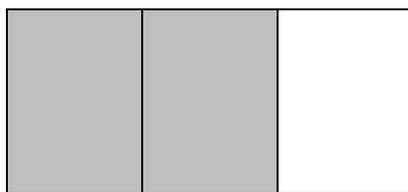
18. Look at the number sentence below:

$$\frac{2}{3} \div \frac{1}{6} =$$

a) Write a story problem that can be solved using this number sentence.

b) Solve your story problem.

c) Use the model below to show or explain your answer.





19.  $\frac{5}{6} \div \frac{1}{12} =$

20.  $12 \overline{)2,484}$

21. Seth wants to buy a new skateboard that costs \$169. He has \$88 in the bank. If he earns \$7.25 an hour pulling weeds, how many hours will Seth have to work to earn the rest of the money needed to buy the skateboard? Show your work here.

22. Estimate the sum of 16.3 and 8.75.

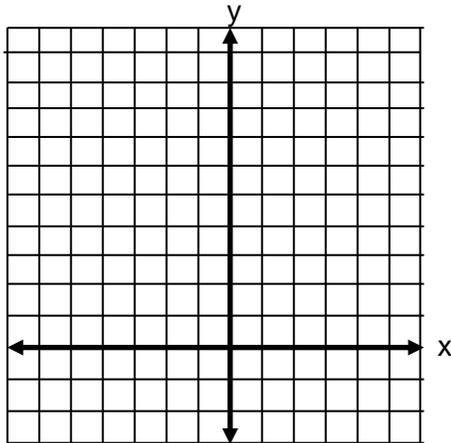
23. What is the greatest common factor (GCF) of 18 and 36? Show your work here.



24. Use the greatest common factor and the distributive property to find the sum of 56 and 16. Show your work here.
25. Ms. Sweden and Mr. London have donated a total of 90 hot dogs and 72 bags of chips for the class picnic. Each student will receive the same amount of refreshments. All refreshments must be used. What is the greatest number of students that can attend the picnic? How many bags of chips will each student receive? How many hotdogs will each student receive? Show your work here.
26. The elementary school lunch menu repeats every 15 days; the middle school lunch menu repeats every 10 days. Both schools are serving pizza today. In how many days will both schools serve pizza again? Show your work here.



27. Use an integer to represent 45 feet below sea level. Show your work here.
28. Use an integer to represent 45 feet above sea level. Show your work here.
29. What would 0 (zero) represent in the scenario in problems #27 + #28. Show your work here.
30. What is the opposite of  $5\frac{1}{2}$ ? Explain your answer.
31. Graph the points ( 2, 3 ) and ( -2, 3 ) in the coordinate plane. Are these points reflections of each other over the x-axis? Explain how you know.





32. Place the following numbers on a number line:  $-3.5$ ,  $3$ ,  $2.2$ ,  $-2\frac{3}{5}$ ,  $0.4$ ,  $-4$ ,  $\frac{11}{2}$ .  
Then list the numbers from least to greatest.



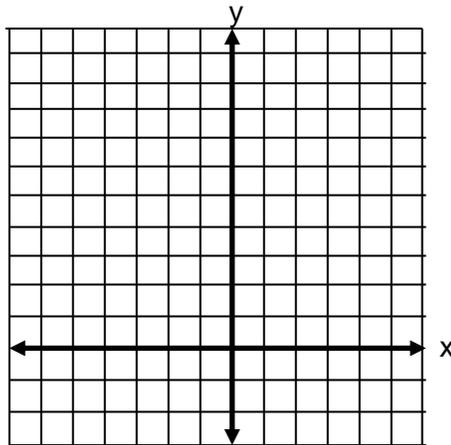
33. Write a statement to compare  $-3\frac{1}{2}$  and  $-5$ . Explain your answer.
34. One thermometer shows  $-4^{\circ}\text{C}$  and another thermometer shows  $-6^{\circ}\text{C}$ . Which is the colder temperature? How much colder? Write an inequality to show the relationship between the temperatures. Show your work here.
35. A meteorologist recorded temperatures in four cities around the world. List these cities in order from coldest temperature to warmest temperature:
- |           |              |
|-----------|--------------|
| Albany    | $5^{\circ}$  |
| Anchorage | $-6^{\circ}$ |
| Buffalo   | $-7^{\circ}$ |
| Juneau    | $-9^{\circ}$ |
| Reno      | $12^{\circ}$ |



36. What is the  $|-7\frac{1}{2}|$ ? Show your work here.

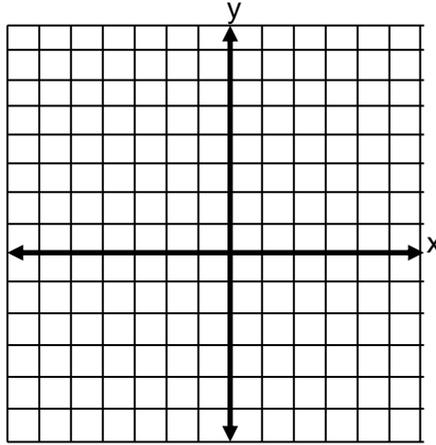
37. Which numbers have an absolute value of 8? Explain why?

38. What is the distance between  $(-3, 2)$  and  $(-7, 2)$ ?





39. What is the distance between  $(2, -4\frac{1}{2})$  and  $(2, 3\frac{1}{4})$ ?



## Expressions and Equations

Show your work for each of the problems below.

40. What is the value of each of the following?

a.  $0.2^3$

b.  $3 + 2^3 \cdot 4$

c.  $6^2 + 21 \div 3 - 20$

41. What is the area of a square with a side length of  $2x$ ?



**Show your work for each of the problems below.**

42. What is the value of  $x$  in the following equation?  $3^x = 81$

43. State the following algebraic expression in words.

a.  $r + 24$

b.  $n \cdot 5$

c.  $s \div 4$

44. Write an algebraic expression for each statement:

a. 4 less than 2 times a number

b. 4 times the sum of a number and 6

c. The quotient of the sum of  $x$  plus 3 and 5



**Show your work for each of the problems below.**

45. Evaluate the expression  $2x + 3y$  when  $x$  is equal to 3 and  $y$  is equal to 4.2.

46. Evaluate  $3(x + 2) - 5x$ , when  $x = \frac{1}{2}$ .

47. Evaluate  $6xy$  when  $x = 3.5$  and  $y = 7$ .

48. Evaluate the following expression when  $x = 5$  and  $y = 3$

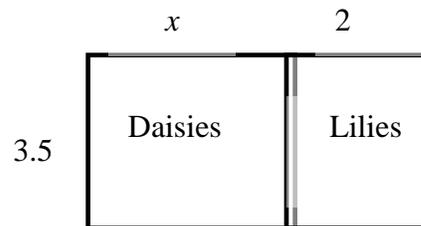
$$\frac{x^3 + y^2}{2}$$



**Show your work for each of the problems below.**

49. The expression  $c + 0.06c$  can be used to find the total cost of an item with 6% sales tax, where  $c$  is the pre-tax cost of the item. Use the expression to find the total cost of an item that cost \$35.

50. Given that the width is 3.5 units and the length can be represented by  $x + 2$ , the area of the flowers below can be expressed as  $3.5(x + 2)$ . Write another expression representing the area of the flowers.



51. Write an equivalent expression for  $2(x + 3) + 4(x + 5)$ .



**Show your work for each of the problems below.**

52. Are the expressions equivalent? Explain your answer.

$$3x + 6$$

$$3(x + 2)$$

$$2x + 6 + x$$

$$x + x + 2 + 4 + x$$

53. Brian had 56 papers in his desk. His teacher gave him some more and now he has 100. How many papers did his teacher give him?

54. The equation  $0.44s = 8.8$  where  $s$  represents the number of stamps in a booklet. The booklet of stamps costs \$8.80 and each stamp costs 44 cents. How many stamps are in the booklet? Explain the strategies used to determine the answer. Show that the solution is correct using substitution.



**Show your work for each of the problems below.**

55. Ten is less than 2 times another number can be shown by the inequality  $10 < 2n$ . What numbers could possibly make this a true statement?
56. Write an expression to represent Karl's age three years ago, when  $p$  represents his present age.
57. Write an expression to represent the number of wheels,  $w$ , on any number of motorcycles.
58. A gymnastics studio charges \$125 to rent the studio for a party and then \$10 per person. Write an expression to represent the cost for any number of people. What is the cost for a party with 20 people?



**Show your work for each of the problems below.**

60. Jamal gets \$15 for babysitting. He spends \$5.33 on lunch and \$2.99 on a new app. Write and solve an equation to show how much money Jamal has left.

61. Graph  $x \leq 5$ .



62. The Perez family spent less than \$700 last month on groceries. Write an inequality to represent this amount and graph this inequality on a number line.



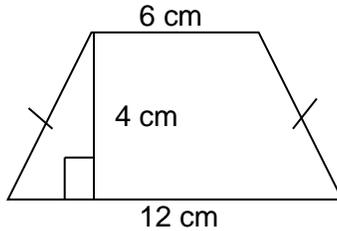
## Geometry

63. Find the area of a right triangle with a base length of 4 units, a height of 3 units, and a hypotenuse of 5.



**Show your work for each of the problems below.**

64. Find the area of the trapezoid shown below using the formulas for rectangles and triangles.



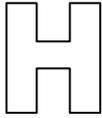
65. A rectangle measures 2 inches by 5 inches. If the lengths of each side double, what is the effect on the area?

66. The lengths of the sides of a bulletin board are 4 feet by 8 feet. How many index cards measuring 3 inches by 5 inches would be needed to cover the board?



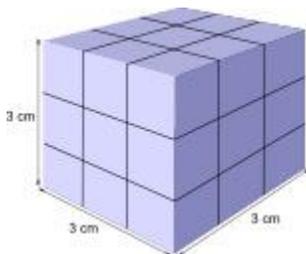
**Show your work for each of the problems below.**

67. The sixth grade class at Hernandez School is building a giant wooden H for their school. The "H" will be 10 feet tall and 10 feet wide and the thickness of the block letter will be 2.5 feet. How large will the H be if measured in square feet?



68. Leo's recipe for banana bread won't fit in his favorite pan. The batter fills the 8.5 inch by 11 inch by 1.75 inch pan to the very top, but when it bakes it spills over the side. He has another pan that is 9 inches by 9 inches by 3 inches, and from past experience he thinks he needs about an inch between the top of the batter and the rim of the pan. Should he use this pan? (The pans are rectangular prisms).

69. Amy wants to build a cube with 3 cm sides using 1 cm cubes. How many cubes does she need? How many 1 cm cubes would she need to build a cube with 6 cm sides?

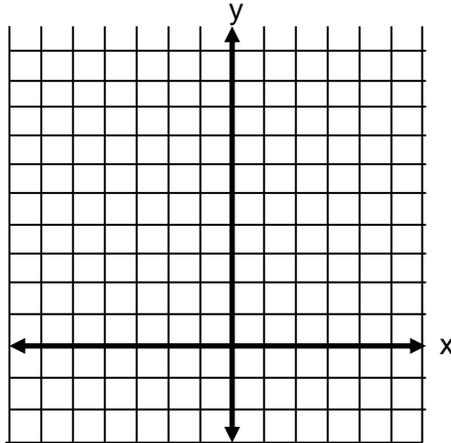




**Show your work for the problem below.**

70. If the points on the coordinate plane below are the three vertices of a rectangle, what are the coordinates of the fourth vertex? How do you know? What are the length and width of the rectangle? Find the area and the perimeter of the rectangle.

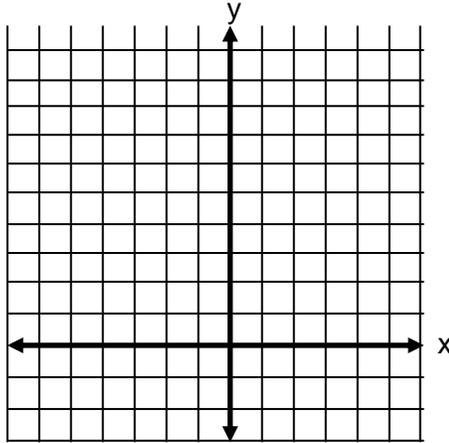
A (-3, 2); B (1, 2); C (-3, -1) D (?, ?)





**Show your work for the problem below.**

71. On a map, the library is located at  $(-3, 4)$ , the town hall is located at  $(0, 4)$  and Bennet Academy is located at  $(0, 0)$ . Represent the locations as points on a coordinate grid with a unit of 1 mile.

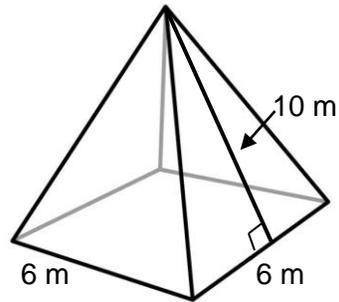


- a. What is the distance from the library to the town hall? The distance from the town hall to Bennet Academy? How do you know?
- b. What shape does connection the three locations form?
- c. The city council is planning to place a park in this area. How large is the area of the planned park?



**Show your work for the problem below.**

72. Create a net for the given pyramid then calculate its surface area.





## **Statistics and Probability**

Show your work for the problem below.

73. Nineteen students completed a writing sample that was scored on organization. The scores for organization were 0, 1, 2, 2, 3, 3, 3, 3, 3, 3, 3, 4, 4, 4, 4, 5, 5, 5, 6, 6.
- a. Create a dot plot to represent the data.



- b. What are the mean, median, and mode of the data set? What do these values mean? How do they compare?
- c. What is the range of the data? What does this value mean?