

Rising Math 8 Students

Name: _____

Please complete the packet over the summer and return to your Algebra Teacher the first week of school. The mastery of these concepts is a pre-requisite for the Math 8 course. Teachers will review the packet in class. There will be a graded assignment on the material covered in the packet. Please **SHOW ALL WORK** as it is required!

Have a wonderful summer!

See you in September,
Math 8 Teachers

The list of websites below contains tutorials, practice, and quizzes on these topics and more.

<http://www.regentsprep.org>

<http://www.math.com>

<http://library.thinkquest.org>

<http://www.mathgoodies.com/lessons.toc-vol.shtm>

<http://education.jlab.org/solquiz/>

***CREATED BY TEACHERS OF SOUTH COUNTY
SECONDARY SCHOOL***

Number Sense and Computation

No calculator allowed for this section!!



Equivalencies

Recall:

1. *Fraction to decimal:* Divide the numerator by the denominator.
2. *Decimal to percent:* Multiply by 100 (move the decimal 2 places to the right)
3. *Percent to decimal:* Divide by 100 (move the decimal 2 places to the left)
4. *Decimal to fraction:* Write what you read and reduce

Complete the following conversion table. You will need to give the other two forms of the number listed.

| | Fraction | Decimal | Percent |
|----|----------|---------|---------|
| 1. | 1/5 | | |
| 2. | | .85 | |
| 3. | | | 7% |
| 4. | 2/3 | | |
| 5. | | 1.15 | |

Fractions

Recall:

1. *Adding and subtracting fractions:* You must find a common denominator
2. *Multiplying fractions:* No common denominator – just multiply the numerators and multiply the denominators (mixed numbers must be turned into improper fractions)
3. *Dividing fractions:* No common denominator – keep the first number, change the division to multiplication, and use the reciprocal of the second number – flip it (mixed numbers must be turned into improper fractions)

6. $\frac{1}{3} + \frac{3}{4}$

7. $3\frac{2}{5} + \frac{1}{3}$

8. $\frac{4}{5} - \frac{1}{2}$

9. $4\frac{1}{4} - 2\frac{2}{5}$

10. $2\frac{2}{3} + 6\frac{5}{6}$

11. $2\frac{3}{5} - \frac{1}{4}$

12. $\frac{1}{4} \cdot \frac{2}{3}$

13. $\frac{4}{5} \cdot 1\frac{1}{2}$

14. $1\frac{2}{3} \div \frac{2}{7}$

15. $\frac{4}{5} \div \frac{1}{2}$

16. $4\frac{1}{4} \cdot 2\frac{2}{5}$

17. $5\frac{2}{3} \div 2\frac{1}{3}$

Integers

Recall:

- Addition:* If the signs are the same, add the numbers and keep the sign. If the signs are different, subtract and keep the sign of the number that is farther from zero.
- Subtraction:* Keep it, change it, change it, then follow addition rules.
- Multiplication/Division:* Same signs – positive answer; Different signs – negative answer

18. $-4 + 6$

19. $6 + (-5)$

20. $-3 + (-5)$

21. $0 + (-6)$

22. $5 - 9$

23. $-6 - 3$

24. $5 - (-2)$

25. $-4 - (-3)$

26. $4 \cdot -3$

27. $-8 \cdot -3$

28. $-12 \div -2$

29. $-8 \div 4$

Order of Operations

Recall: Simplify the problem in the following 4 steps:

- Parenthesis and Grouping Symbols*
- Exponents*
- Multiplication and Division, in order from left to right*
- Addition and Subtraction, in order from left to right*



10784.36
5
2.719372
9 ÷ 1

30. $18 - 30 \div 6$

31. $48 \div (8 + 4) - 3$

32. $2^3 - 5(2) + 13$

$$33. -6 \div 3 + 18 \div 4 - 3^2$$

$$34. 4 \cdot -2 - 13 + 6 \cdot -2$$

$$35. 4(2 - 5) \div 6 + 9$$

Proportions

Recall: To solve a proportion, cross multiply, then divide

Example:

$$\frac{4}{x} = \frac{10}{15}$$
$$4 \cdot 15 = x \cdot 10$$
$$\frac{60}{10} = \frac{10x}{10}$$
$$6 = x$$



$$36. \frac{x}{12} = \frac{5}{6}$$

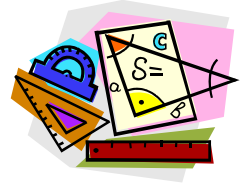
$$37. \frac{4}{9} = \frac{x}{15}$$

$$38. \frac{2}{5} = \frac{9}{x}$$

39. A scale on a map is 1 inch for every 35 miles. If I travel 175 miles, how many inches will that be on the map?

40. A recipe calls for 2 cups of sugar for every 5 cups of flour. If Jon accidentally put in 5 cups of sugar, how much flour must he put in to make the recipe turn out right?

Geometry and Measurement



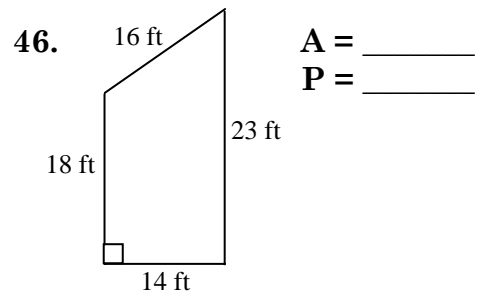
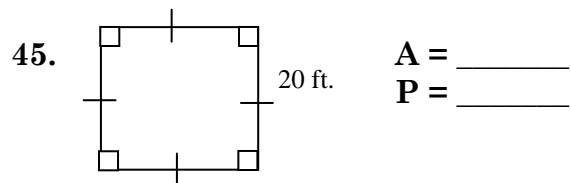
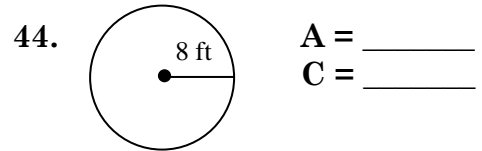
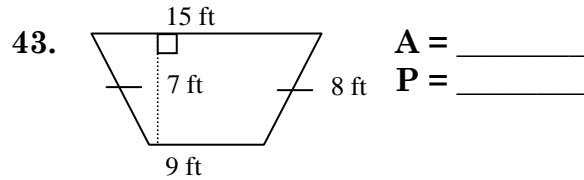
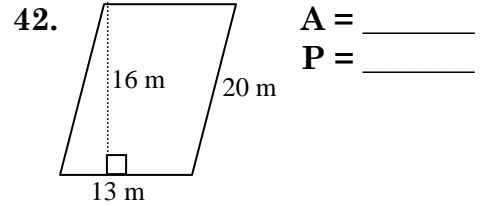
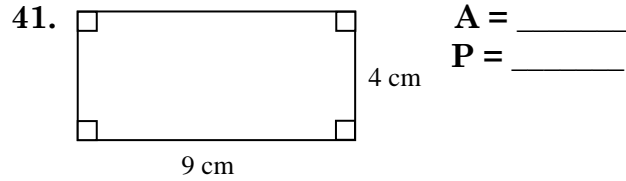
Area and Perimeter

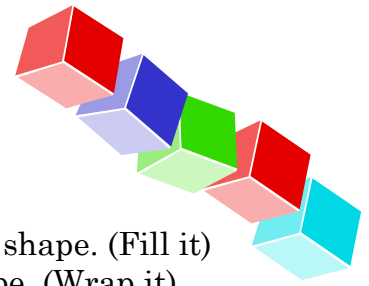
Recall:

Perimeter is the distance around a figure. For all figures except a circle, you will simply add up the outside.

Area is the space occupied by a figure, and every shape has its own formula. See the attached formula sheet for the correct formulas.

Find the area and perimeter of the following figures.





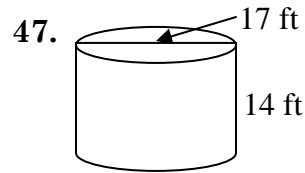
Volume and Surface Area

Recall:

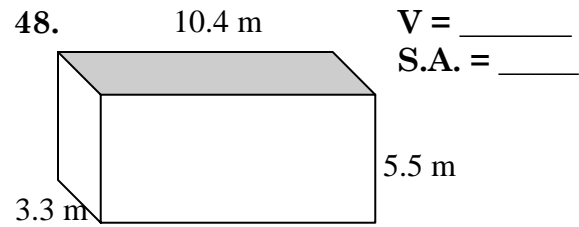
Volume is the amount of space occupied by a three-dimensional shape. (Fill it)

Surface area is the area of each face of a three dimensional shape. (Wrap it)

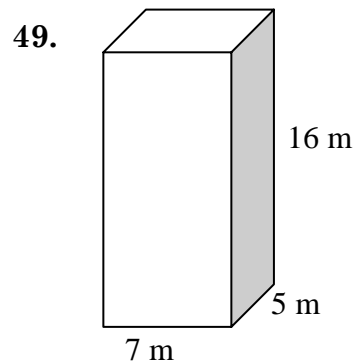
Use the formulas on the attached sheets to help you solve these problems.



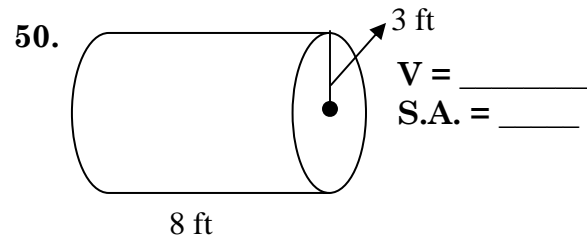
$V = \underline{\hspace{2cm}}$
 $S.A. = \underline{\hspace{2cm}}$



$V = \underline{\hspace{2cm}}$
 $S.A. = \underline{\hspace{2cm}}$

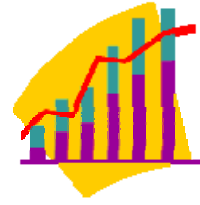


$V = \underline{\hspace{2cm}}$
 $S.A. = \underline{\hspace{2cm}}$



$V = \underline{\hspace{2cm}}$
 $S.A. = \underline{\hspace{2cm}}$

Probability and Statistics



Measures of Central Tendency

Recall:

Mean is the average of the data.

Median is the middle number when the set of data is put in order.

Mode is the number that occurs most often in a set of data.

51. Find the mean, median, and mode of these numbers.

8, 5, 3.5, 6, 2, 4, 2.5, 4

mean _____

median _____

mode _____

52. Find the mean, median, and mode of these numbers.

16, 25, 16, 21, 13, 18, 24, 27, 28, 16, 6, 29, 25

mean _____

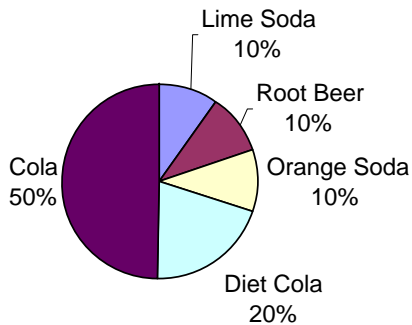
median _____

mode _____

Creating and Analyzing Graphs

This pie chart shows the percentage of each type of beverage bought from a vending machine outside the school cafeteria.

School Vending Machine

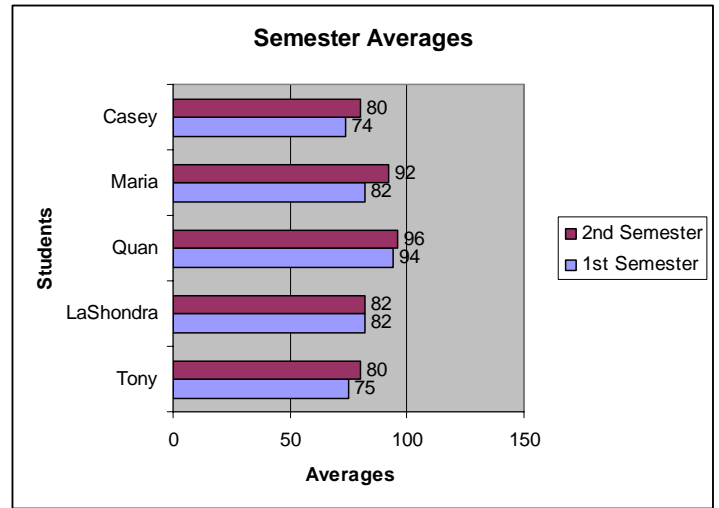


53. It there were 20 drinks bought, how many of them were root beer? _____

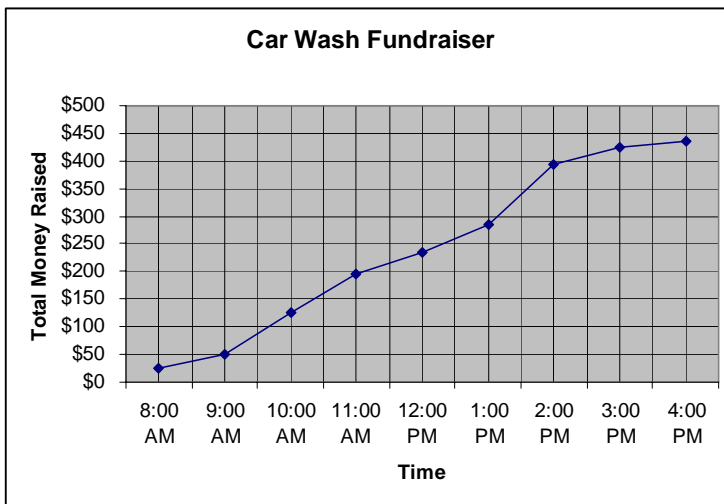
54. Which drink is most likely to be purchased next? Why?

Based on the double-bar graph to the right, **55.** Which student improved the most from the first semester to the second semester?

56. Tim is in the same class as the five students included on the bar graph. His first semester average was an 86%. What would you expect his second semester average to be?



The band held a free car wash to raise money for their trip to Montreal, Canada. People were asked to donate to the trip in exchange for having their car washed.



57. During which time period(s) did the band raise the most money?

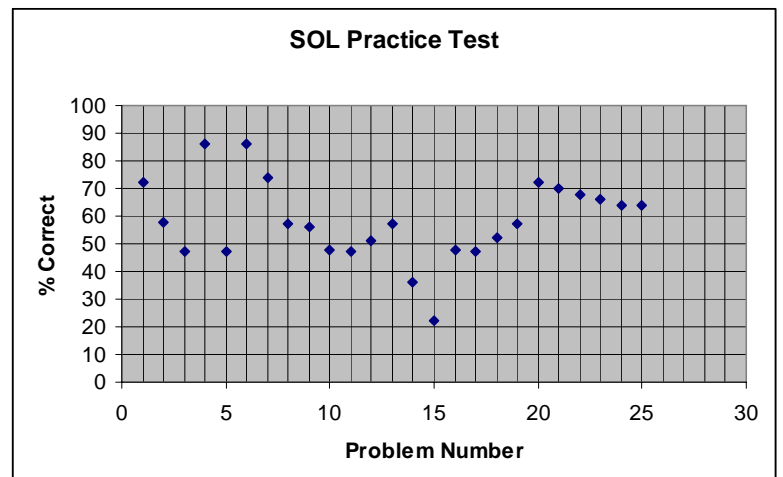
58. During which time period(s) did the band raise the least money?

59. The band is considering extending their car wash by one hour next year. Would they be better off adding one hour to the beginning of the car wash or one hour to the end of the car wash? Why?

The scatter plot below shows the percent of students who correctly answered specific questions on the SOL Practice Test.

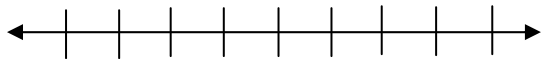
60. If we were to extend this scatter plot to include questions 26-60, what range would you expect the percent of students who answered each problem correctly to be?

61. What type of correlation does this scatter plot have?



62. Use this data to create a **box-and-whisker** plot.

82, 85, 95, 85, 65, 72, 75, 85, 94, 65

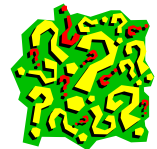


63. Use this data to create a **box-and-whisker** plot.

156, 160, 152, 135, 157, 158, 135, 145, 151, 160, 152, 162, 157, 158, 142



Patterns, Functions and Algebra



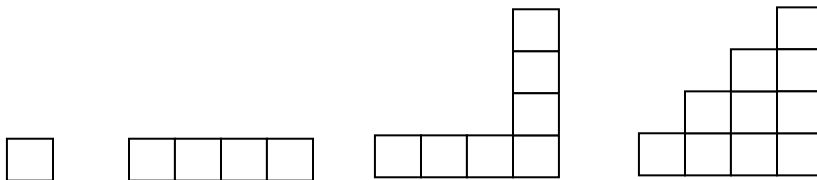
64. Find the **next three numbers** in the pattern.

2, 7, 12, 17, 22, _____, _____, _____

65. Find the **next three numbers** in the pattern.

1, 2, 4, 8, 16, _____, _____, _____

66. Look at this pattern of squares. **Write a rule** for this pattern. **How many squares** are in the **next** figure?



Use the function tables given to find the function rule.

67.

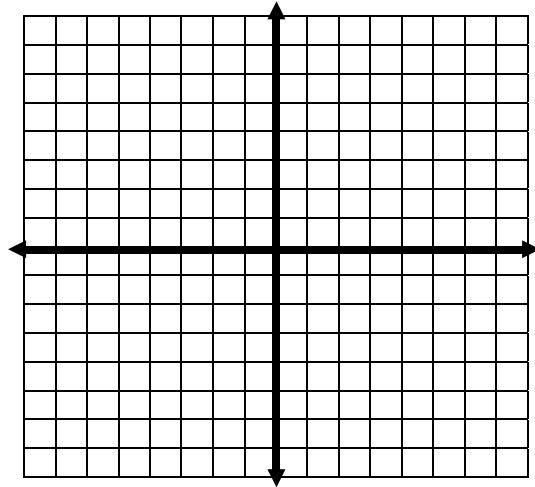
| x | ? _____ |
|---|---------|
| 4 | -12 |
| 5 | -15 |
| 6 | -18 |
| 7 | -21 |
| 8 | -24 |

68.

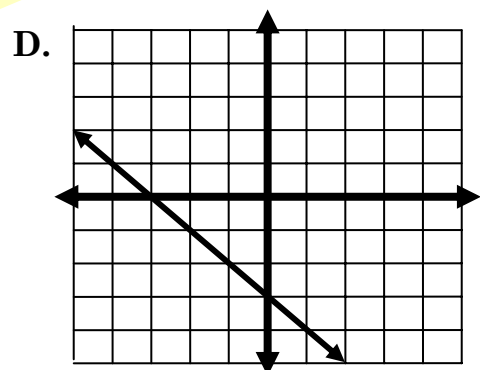
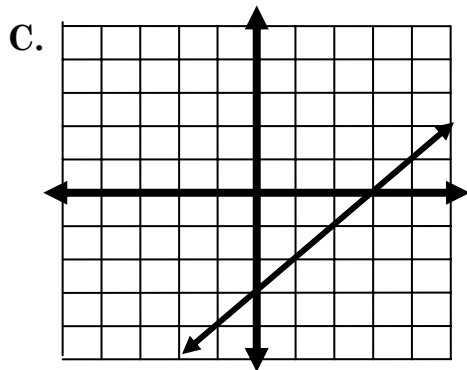
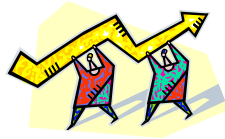
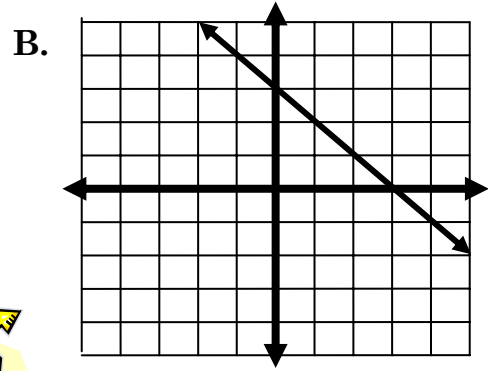
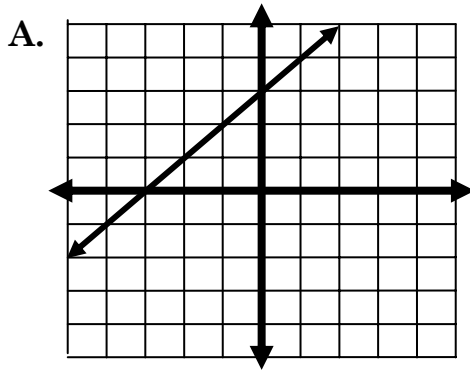
| x | ? _____ |
|---|---------|
| 1 | 1 |
| 2 | 4 |
| 3 | 7 |
| 4 | 10 |
| 5 | 13 |

69. Make a **table of possible solutions** and **graph** the linear equation $y = 2x - 1$.

| x | y |
|---|---|
| | |
| | |
| | |
| | |



70. Which graph below best represents the equation $y = -x + 3$?



Solve the following equations.

71. $2x + 5 = -7$

72. $\frac{x}{-3} + 7 = -6$



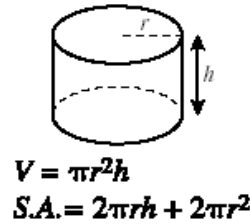
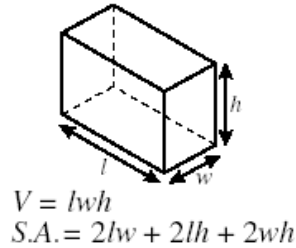
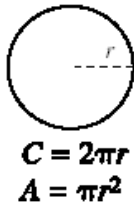
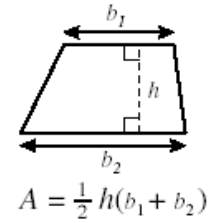
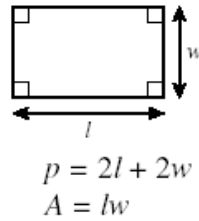
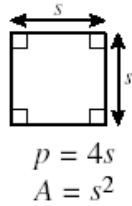
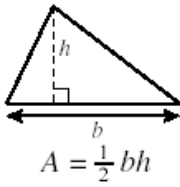
73. $-4x - 6 = 13$

74. $\frac{x}{6} - 2 = -11$

Have A Great Summer!

Grade 7 Mathematics Formula Sheet

Geometric Formulas



Abbreviations

| | |
|-------------------|-----------------|
| milligram | mg |
| gram | g |
| kilogram | kg |
| milliliter | mL |
| liter | L |
| kiloliter | kL |
| millimeter | mm |
| centimeter | cm |
| meter | m |
| kilometer | km |
| square centimeter | cm ² |
| cubic centimeter | cm ³ |

| | |
|-------------|--------|
| ounce | oz |
| pound | lb |
| quart | qt |
| gallon | gal. |
| inch | in. |
| foot | ft |
| yard | yd |
| mile | mi. |
| square inch | sq in. |
| square foot | sq ft |
| cubic inch | cu in. |
| cubic foot | cu ft |

| | |
|--------------------|-------------|
| area | <i>A</i> |
| perimeter | <i>p</i> |
| circumference | <i>C</i> |
| volume | <i>V</i> |
| total surface area | <i>S.A.</i> |

| | |
|--------|-----|
| year | yr |
| month | mon |
| hour | hr |
| minute | min |
| second | sec |

Pi

$\pi \approx 3.14$
 $\pi \approx \frac{22}{7}$