

Due date: 8/29/22

DIRECTIONS/INFORMATION:

- The Summer Enrichment must be completed in its entirety over the summer and turned in on the FIRST DAY OF SCHOOL.
- This assignment will count as a test grade for the first marking period. Late submissions will reduce the grade earned.
- This packet contains math skills required for Algebra 1.
- The packet is divided into eight, one-week sections that will allow you to develop a schedule for completing the packet. Follow the directions given in each section of the packet carefully.

Carver Engineering and Science

Mr. Lick - Algebra 1

2022-2023 School Year

Parents/Guardians:

It has been a wonderful year and I am already really excited about starting up again in the fall. In September, each 8th grader will be enrolled in an Algebra 1 math class. The supply list for my class is below, please consider providing these for the start of school this fall. Thanks so much for your support, have a great summer!

Supply List:

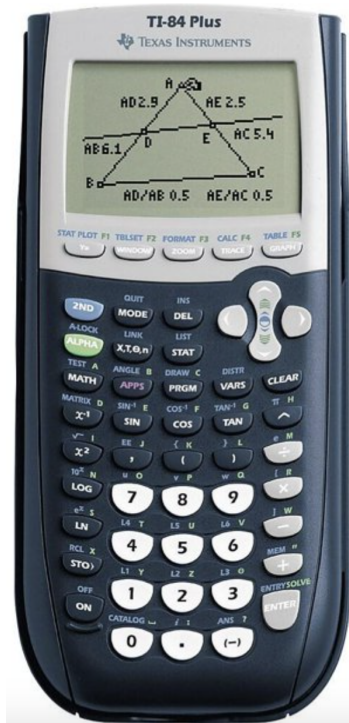
-Three ring binder with lined paper

-Pencils

-TI 84 Plus Graphing Calculator*

*The graphing calculator is required for all **high school** students. Although it isn't required for 8th grade, we will use them frequently in class and on homework in preparation for the PSSA and Keystone Exams in June.

Please be sure to write the student's name on both the case and the calculator body in Sharpie so it can be returned if left behind. If you do not purchase one, I will have some calculators available to borrow in the fall.



Week 1 - Numbers and Operations

Web resources:

Addition of Integers –

- <http://www.mathgoodies.com/lessons/vol5/addition.html>
- <http://www.youtube.com/watch?v=204uFu0DRWE>

Subtraction of Integers –

- <http://www.mathgoodies.com/lessons/vol5/subtraction.html>

Multiplication and division of integers

- http://www.mgccc.edu/learning_lab/math/multdiv.html

Absolute value –

- <http://www.purplemath.com/modules/absolute.htm>

Square root - $\sqrt{\#}$

- <https://www.khanacademy.org/math/arithmetic/exponents-radicals/radical-radicals/v/understanding-square-roots>

Remember to do the following without a calculator.

1) For each problem, add the two integers and show or describe how you got your answer:

a) $-21 + 3$

a) _____

b) $17 + (-20)$

b) _____

c) $-12 + (-5)$

c) _____

Week 1 cont. *Remember to do the following without a calculator.

2) Complete the following subtraction problems and show or describe how you got your answer:

a) $22 - (-15)$

a) _____

b) $-15 - 7$

b) _____

c) $12 - 18$

c) _____

3) Complete the following problems:

a) Which of the following equal -39 ? _____
(circle *all* correct answers; there may be more than one)

i. $-13 \cdot 3$

ii. $-13 \cdot (-3)$

iii. $13 \cdot (-3)$

iv. $-1 \cdot 39$

b) $\frac{24}{-3} =$ _____

4) Which expression has the larger value, $|-9|$, $|3|$, or $|2 - 5|$? How do you know?

5) Which expression has the larger value, $\sqrt{36}$ or 2^3 ? How do you know?

Week 2 – Fractions/Decimals/Percents

Web resources:

Vocabulary - information about words underlined in problems below can be found at the sites below.

- <http://www.mathwords.com/>
- <http://www.math.com/school/glossary/glossindex.html>

Fractions and mixed numbers –

- <https://www.khanacademy.org/math/arithmetic/fractions>

Percent problems - http://www.mathgoodies.com/lessons/percent/sale_price.html

Equivalent fractions, decimals, percents –

- <http://www.mathsisfun.com/decimal-fraction-percentage.html>
(scroll down to “conversions”)

Remember to do the following problems without a calculator.

1) Divide. Show your work. $-\frac{5}{6} \div \frac{15}{-6} =$ _____

2) Write – 2.75 as a ratio of two integers. Show your work. _____

3) Write the reciprocal of $-\frac{5}{9}$ _____

4) Multiply. Show your work. $\frac{15}{7} \cdot \frac{4}{5}$ _____

Week 2 cont.

5) Subtract. Show your work. $\frac{3}{4} - \frac{1}{2}$ _____

6) A jacket originally sold for \$45. This week it is on sale for 20% off. What is the discount and what is the sale price? Show your work.

Discount _____

Sale price _____

7) A student answered 44 questions correctly on a test with 55 questions. What percent of the test was answered correctly? Show your work.

Percent correct _____

8) Write $\frac{12}{16}$ as a fraction in simplest form.

Then write the equivalent decimal and percent. Show your work.

Simplest form _____ Decimal _____ Percent _____

Week 2 cont.

9) Add. Show your work. $2\frac{1}{3} + \frac{7}{2}$ _____

10) Add. Show your work. $5.01 + 0.431 + 40$ _____

Week 3 - Ratio and proportion

Web resources

<http://www.khanacademy.org/math/arithmetic/rates-and-ratios/ratios-and-proportions>

Complete the following problems. SHOW ALL WORK ON THIS PAGE

1. Reduce the fraction to lowest terms: $\frac{12}{15}$
2. A. Write the ratio of girls to boys in a class with 12 girls and 15 boys.
Reduce the ratio to lowest terms.

B. Use the information from Part A to estimate the number of girls in the school if there are a total of 1350 students in the whole school, and the class in Part A is representative of all classes in the school.
3. A. The equation below is called a _____ because it shows that two ratios are equal.

B. Solve for d : $\frac{16}{d} = \frac{2}{3}$

Week 3 cont.

4. Solve for g : $\frac{12}{27} = \frac{g}{1350}$

5. A 3.5 pound package of hamburger costs \$11.20.

A. What is the cost of one pound of hamburger?

B. If you did not write a proportion to answer question #5A above, write a proportion that you could have used to answer question #5A.

6. The scale on a map indicates 1 inch = 150 miles. The distance from Philadelphia to Miami is 1200 miles. On the map, how far apart are Philadelphia and Miami?

7. A recipe calls for 3 cups of sugar for every 4 pounds of fruit. How many cups of sugar are required for 10 pounds of fruit?

Week 4 – The “Language” of Algebra

Web resources:

- <http://www.mathgoodies.com/lessons/vol7/equations.html>
- <http://www.purplemath.com/modules/translat2.htm>

Complete the problems below:

- 1) *The product of a number n and 6 is 42.* Which of the following equations represents this statement? Circle your answer.

A. $n + 6 = 42$ B. $6n = 42$ C. $\frac{n}{6} = 42$ D. $n - 6 = 42$

- 2) Write an algebraic expression for *nine more than three times a number x*

- 3) Let t be the time now. Write an expression for *the time 2 hours ago*.

- 4) Write an algebraic expression for *the sum of r and s* .

- 5) Write an algebraic expression for the following: *Five times the sum of p and q* .

- 6) Write an equation to represent the following:

The quotient of two numbers, a and b , is 8.

Week 4 cont.

7) Let d represent the amount of money Shea has. Use d to write an algebraic expression for each of the following:

- a. Shea's sister's money if she has *twice as much money as Shea*.

- b. Shea's friend's money if he has *\$9 less than Shea*.

- c. Shea's brother's money if he has *half as much as Shea*.

8) If " x " is the number of CDs packed in each case at the warehouse, write an expression to represent the *number of CDs in 300 cases*.

Week 5 - Algebraic Expressions and Equations

Web resources

Evaluate expressions

<http://www.khanacademy.org/math/algebra/solving-linear-equations-and-inequalities/variable-and-expressions/v/variables-and-expressions-1>

Solve equations

<http://www.purplemath.com/modules/solvelin3.htm>

Order of operations

http://www.khanacademy.org/math/arithmetic/multiplication-division/order_of_operations

Combine like terms

<http://www.purplemath.com/modules/polydefs2.htm>

Complete the following problems. SHOW ALL WORK ON THIS PAGE

1. If $x = 1$ and $y = 7$, evaluate $\frac{x+y}{4}$

2. If $x = 3$, which is larger, x^2 or $5x$? *How do you know?*

3. If $x = -3$, which is larger, x^2 or $5x$? *How do you know?*

Week 5 cont.

4. Solve for x. Check your solution.

A. $9x = 27$

B. $-3x + 4 = 22$

5. Simplify. Be sure to use the correct order of operations.

A. $4 + 5 \cdot 4 - 15 \div 3$

B. $6 \cdot 2t - 3t$

C. $6(2t - 3t)$

Why is problem 5C different from problem 5B?

D. $-(3d - 5) + 3d$

E. $(3x^2 - 6x + 10) + (5x^2 + 6x - 2)$

Week 6 – Coordinate Plane/ Tables & Graphs

Web resources:

Coordinate plane

- <http://www.mathsisfun.com/data/cartesian-coordinates.html>
- <http://www.mathplanet.com/education/algebra-1/visualizing-linear-functions/the-coordinate-plane>

Tables and graphs

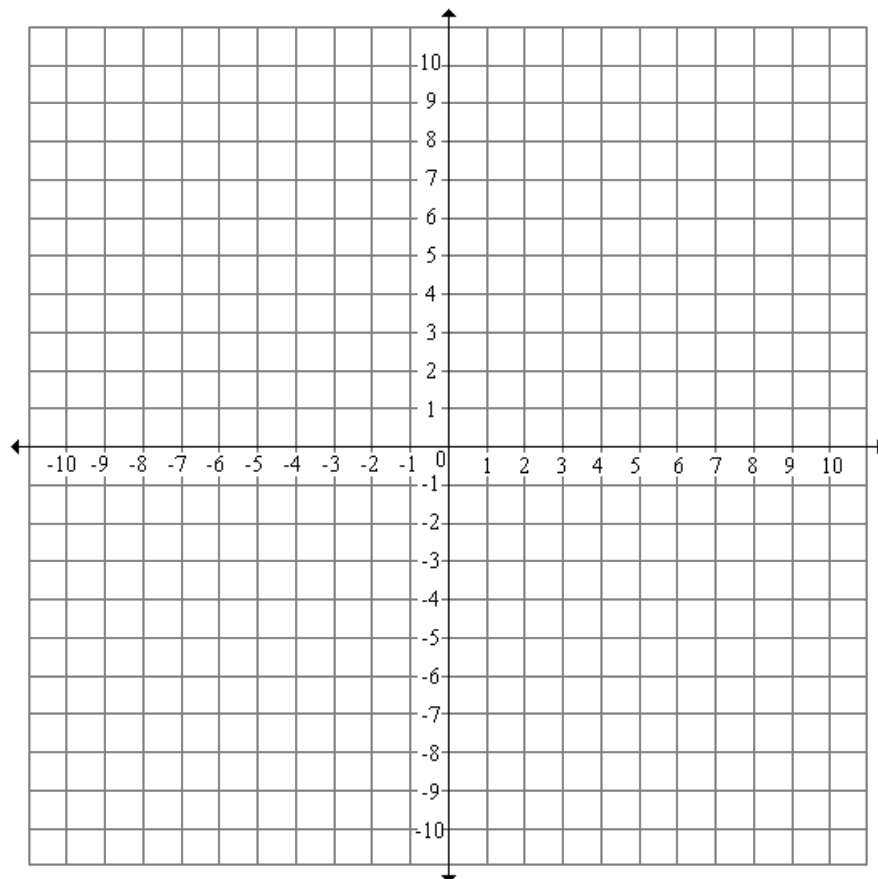
- <http://www.virtualnerd.com/algebra-1/relations-functions/graphing-linear-equations/graphs-examples/linear-equation-graphing-method>

Scatterplots

- <http://www.mathgoodies.com/lessons/graphs/line.html>
- <http://www.purplemath.com/modules/scattreg.htm>

1) Locate the following points on the coordinate plane. Label each point with the correct letter.

A (- 4, 3) B (3, 6) C (0, -5) D (4, -3) E (-1, 0)

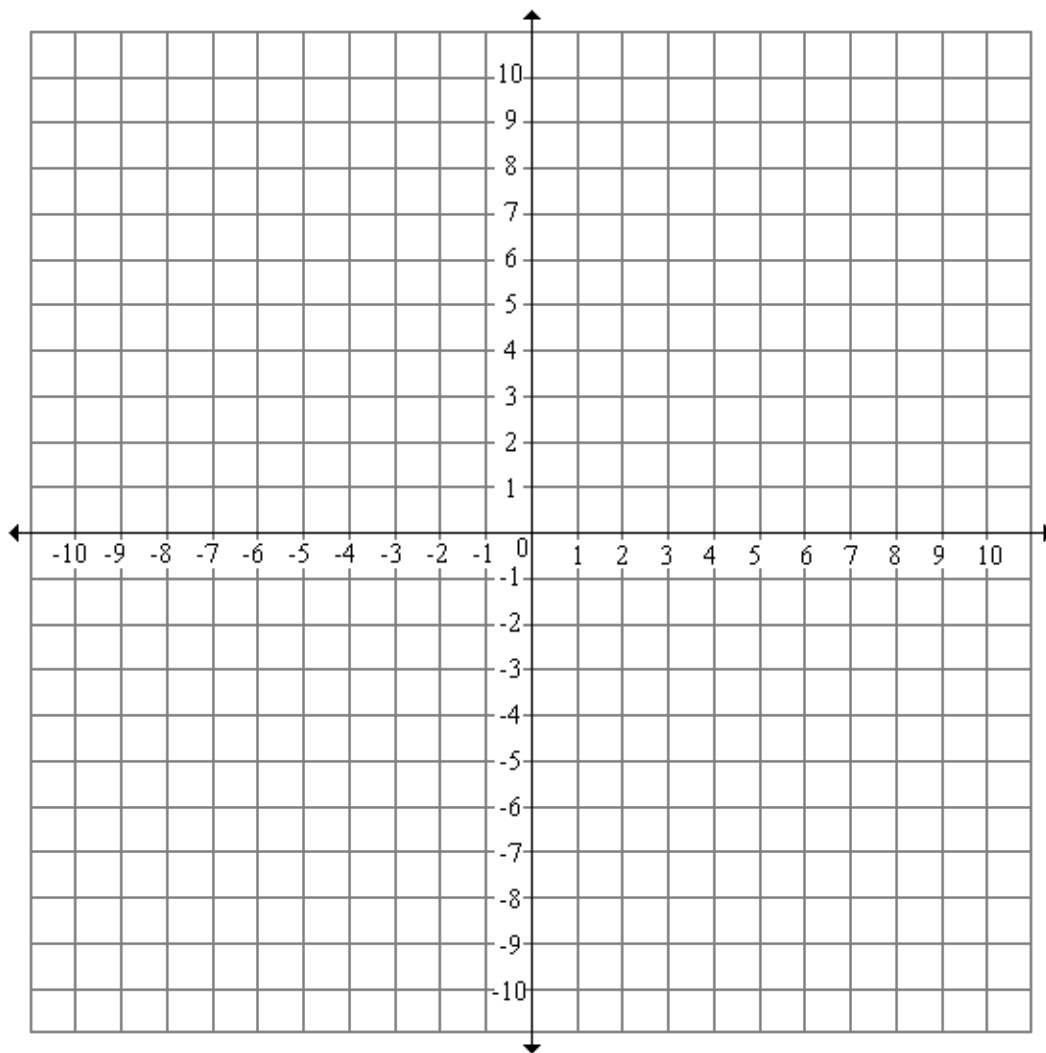


Week 6 cont.

2) The table below shows the growth of a plant that was planted as a seed, 4 inches under the surface of the ground.

x (# days after planted)	0	1	2	3	4	5	6
Y (height of plant in inches)	- 4	- 3.5	- 3	- 2.5			

- Complete the table above.
- If the pattern of growth continues, when will the plant be 1 inch tall?
- Graph the information from the table as a line, on the coordinate plane below.



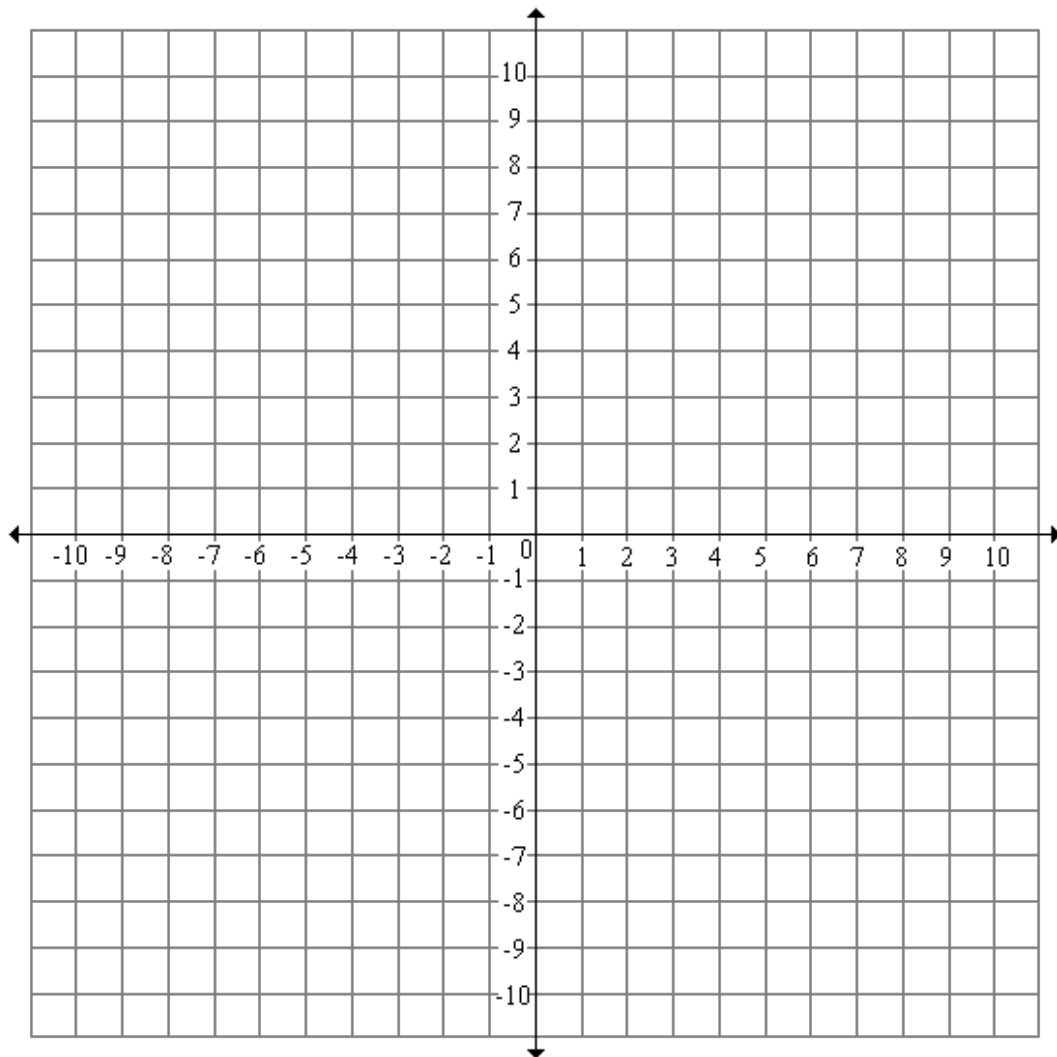
Week 6 cont.

3) Use the equation $y = 3x - 4$ to do the following:

- a. Complete this table of values, choosing five different x values.

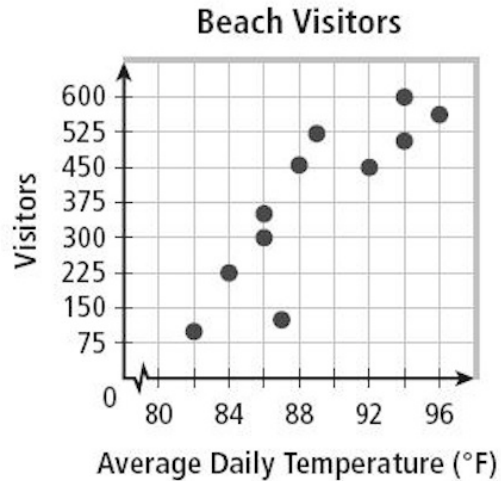
x	y

- b. Graph the line $y = 3x - 4$ on the coordinate plane below.



Week 6 cont.

4) Which statement describes the relationship shown by the data in the scatterplot below? Circle the letter of the correct response.



- A. As the average daily temperature decreases, the number of visitors increases.
- B. The number of visitors decreases as the average daily temperature increases.
- C. The number of visitors increases as the average daily temperature increases.
- D. There is no relationship between the average daily temperature and the number of visitors.

Week 7 - Area and perimeter

Web resources

Area of rectangles

http://www.mathgoodies.com/lessons/vol1/area_rectangle.html

Area of triangles

http://www.mathgoodies.com/lessons/vol1/area_triangle.html

Perimeter

<http://www.mathgoodies.com/lessons/vol1/perimeter.html>

Complete the following problems. SHOW ALL WORK ON THIS PAGE

1. The first floor of a one-story house is in the shape of a rectangle. The house is 25 feet wide and 60 feet from front to back. What is the area of the first floor of the house?

2. A triangle has a base of 10 inches and a height of 25 inches. What is the area of the triangle?

3. A patio is a rectangle 12 feet wide and 16 feet long. The patio is completely surrounded by a fence.
 - A. How long is the fence?

 - B. The length of the fence is called the _____ of the rectangle.

Week 7 cont.

4. A square has an area of 64 square feet.

A. What is the length of each side of the square?

B. What is the perimeter of the square?

5. The length of a rectangle is 6 greater than the width.

A. Write the algebraic expression for length of the rectangle, using w : _____

B. If the perimeter of the rectangle is 52, write the equation for perimeter, using w :

$$52 = \underline{\hspace{2cm}}$$

6. Imagine you are building a rectangular playground in a township park and it needs to be 1000 square feet in area. You have the job of deciding the length and width of the playground and ordering the fence to enclose the playground.

A. Choose the length and the width. There is more than one correct answer, but the playground must be a rectangle and the area must be 1000 square feet.

Length = _____

Width = _____

Show your work to verify the area is 1000 square feet.

B. What is the perimeter of the rectangle you chose?
(In other words, how much fence do you need to order?)

Week 8 - Data and probability

Web resources

Median and mean (#1 below)

<http://www.purplemath.com/modules/meanmode.htm>

Box and whisker plots (#2 below)

<https://www.khanacademy.org/math/probability/descriptive-statistics/Box-and-whisker-plots>

Scatterplots (#3 below)

<http://www.mathgoodies.com/lessons/graphs/line.html>

<http://www.purplemath.com/modules/scattreg.htm>

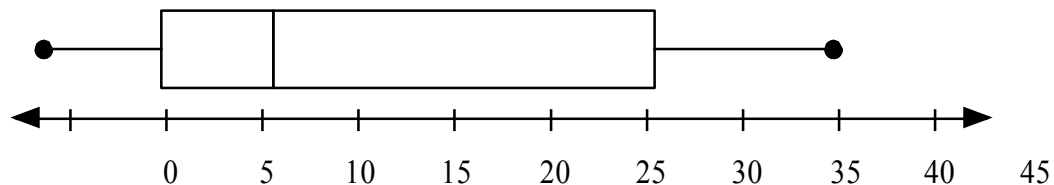
Probability (#4-6 below)

https://www.khanacademy.org/math/trigonometry/prob_comb/basic_prob_precalc/v/basic-probability

Complete the following problems. SHOW ALL WORK ON THIS PAGE

1. The students in a summer school math class took a 10 point quiz on Friday and received scores of 7, 8, 8, 9, 9, 9, 6, 5, 4, and 9.
 - A. What is the median of the scores?
 - B. What is the mean score?

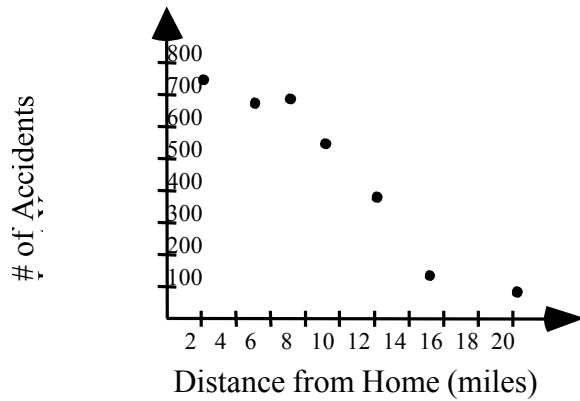
2. The box-and whisker plot below represents the number of home runs hit by 20 major league baseball players.



- A. What is the median number of home runs hit by the 20 players?
- B. Approximately how many of the players hit more than 25 home runs?

Week 8 cont.

3. The graph below describes the relationship between the distance from home and the number of accidents.



- A. As the distance from home increases, the number of accidents _____.
- B. Approximately _____ accidents occurred more than 20 miles from home.
4. A. If you flip a coin once, what is the probability of the coin landing on “heads”?
- B. If you flip a coin 3 times, what is the probability of the coin landing on “heads” all 3 times?
5. If you roll a 6-sided die with the numbers 1, 2, 3, 4, 5, and 6 on it, what is the probability of the die landing on an odd number?
6. Name an event which has a probability of “one.”