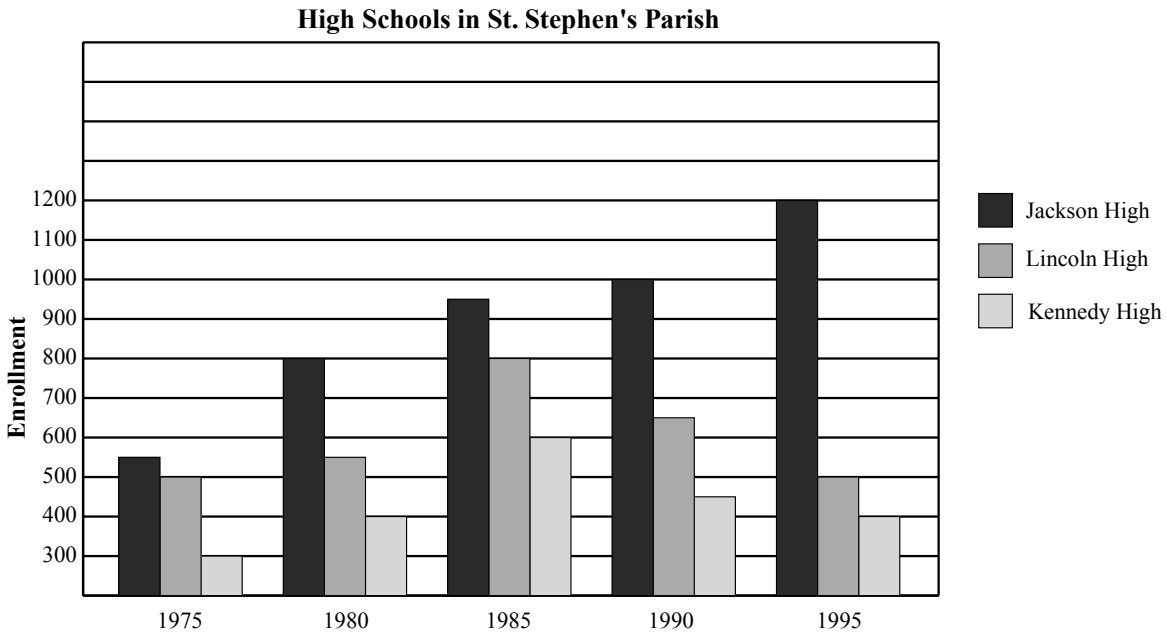
SAMPLE PROBLEMS

7.



a. What was the average enrollment at Lincoln High for these 5 years?

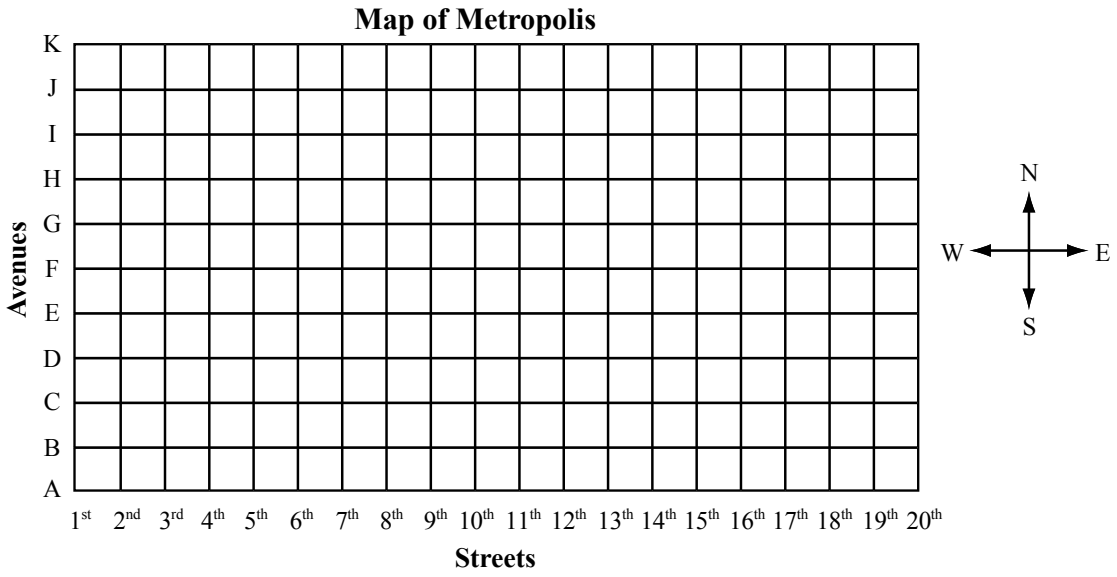
b. In which of these years did one of the schools have twice the enrollment of another school?

c. In which year did one of the schools have $\frac{1}{3}$ as many students as another school?

d. Which two schools had the same pattern of enrollment changes for the years included in the graph? Describe the pattern.

e. True or False: In 1990 and in 1995, Jackson High had more students than Lincoln and Kennedy combined.

13.



In cities, the distance from one location to another is often measured in "blocks." On this map, a block is the distance between any two adjacent streets or avenues.

For parts a-g, use the copy of this map that your teacher gives you.

a. Carla's house is at the corner of 15th Street and Avenue B. Put a dot on the map at this location. Label it "Carla's House".

b. Carla leaves her house on her bike. She rides 6 blocks North, then 10 blocks West to get to McBurger's. Put a dot on the map to show where McBurger's is.

c. McBurger's is located at the corner of Avenue _____ and _____ Street.

d. Draw 2 other routes that Carla could follow from her house to McBurger's while always riding North or West.

e. How many blocks would Carla ride on each of these routes?

f. Compare your routes with those of your classmates. How many different routes were drawn?

g. For each route, for how many blocks was Carla riding North? For how many blocks was she riding West?

29. There is a hiking class offered for beginners at Little Canyon. The trail goes down into the canyon, where elevations are below sea level, and up into the mountains where elevations are above sea level.

<u>At noon</u> Joe, Demetrias, and Carlos were at different locations on the trail:

Joe was 128 feet above sea level. During the next hour, he descended (went down) 319 feet.

Demetrias was 230 feet below sea level. During the next hour she ascended (went up) 306 feet.

Carlos was 126 feet above sea level. In the next hour, he ascended 179 feet, then descended 438 feet.

a. Give the elevation (above or below sea level) for each hiker at 1:00 p.m.

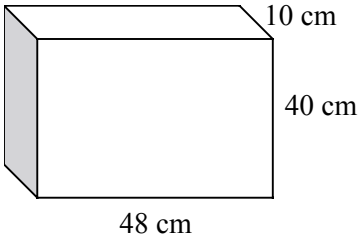
b. What was the difference in elevation for Joe and Demetrias at 1:00 p.m.?

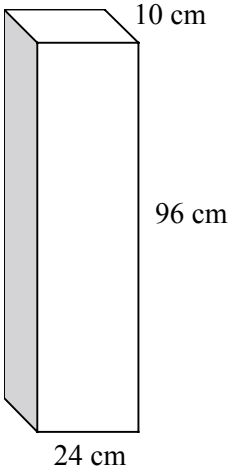
55. A new black-top surface will be constructed along $8\frac{3}{4}$ miles of Highway 42. The job will be done in $1\frac{3}{4}$-mile sections, and the chief engineer has estimated that two weeks will be required for each section. If this estimate is correct, how long will the whole job take?

(Hint: How many fourth-miles are in each section? How many fourth-miles are in the whole job? How many sections are in the whole job?)

Notice that we have led students through a <u>meaningful</u> process for dividing fractions – without any rules about "invert the divisor, then multiply". In fact, they haven't even learned a process for multiplying yet!

64.





a. Find the <u>area</u> of the <u>bottom</u> of each box.

b. What is the <u>volume</u> of each box?

Sugar is sometimes sold in little 1-centimeter cubes.

c. How many of these cubes would fit in each of the boxes?

d. If 250 of these sugar cubes are crushed, the sugar will fill a standard cup.
How many cups of sugar will each box hold?
(Round to the nearest whole number of cups.)

e. A 5 lb bag of sugar provides 3 quarts of sugar.
If the boxes were filled with sugar, <u>about</u> how much would each box weigh?
(Round to a <u>reasonable</u> answer.)

72. LaTeesha has four different-colored sheets of construction paper – red, blue, green, and yellow. She is going to cut out a circle, a square, a triangle, and a rectangle from the construction paper. Each figure will be a different color.
In how many different ways can LaTeesha match the colors with the figures?

128. On an international flight from New Orleans to London there were 300 passengers. 25 percent of the passengers were from France, 15 percent were from Spain, 40 percent were from the U.S., 13 percent were from Asia, 3 percent were from Greece, and the rest were from England.

a. What percent of the passengers were from England?

b. How many passengers were from France?

c. How many passengers were from the U.S. or from England?

d. How many passengers were not from Asia?

e. How many passengers were from neither Spain nor Greece?

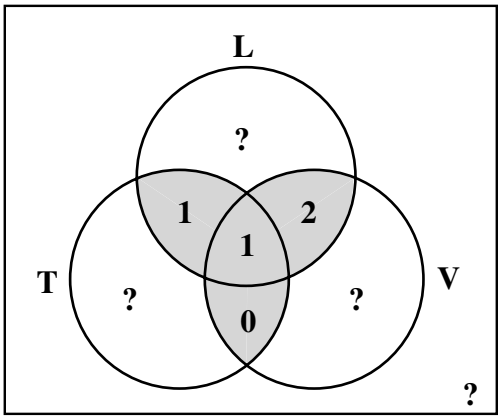
f. The <u>average weight</u> of the passengers was 150 pounds. What was the total weight of the 300 passengers? Explain how you got your answer.

82. **In this Venn diagram:**

Circle L represents the set of <u>different</u> letters that are part of the word LOUISIANA.

Circle V represents the set of <u>different</u> letters that are part of the word VIRGINIA.

Circle T represents the set of <u>different</u> letters that are part of the word TEXAS.



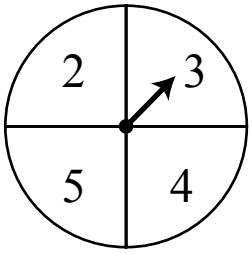
a. <u>Explain</u> what the numbers in each of the <u>four shaded regions</u> represent.

b. Fill in the numbers that are designated by <u>question marks</u> in the diagram.

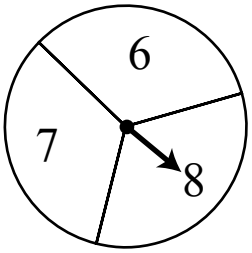
93. **The arrows on these two circles can spin around the center point.**

Circle A is separated into 4 equal sectors, and circle B is separated into 3 equal sectors.

Suppose that both arrows are spun:



A



B

a. How many <u>different pairs of numbers</u> could the two arrows land on?

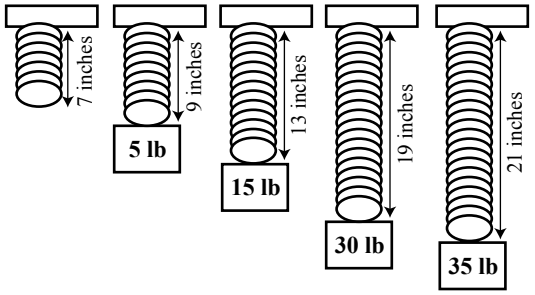
b. Do all of these <u>pairs</u> have the same chance of being "selected" by the arrows?

c. What is the probability that the <u>sum</u> of the two numbers "selected" by the arrows is 9? What is the probability that the sum is 10?

d. If the arrows were spun 12,000 times, which of these is your best guess for the number of times the sum will be 11? Explain how you got your answer.

1000 times 2000 times 3000 times 4000 times

96. **A spring is 7 inches long. One end of it is attached to the top of a door frame. When weights are attached to the other end of the spring, it stretches. These pictures show the length of the spring for various amounts of weight.**



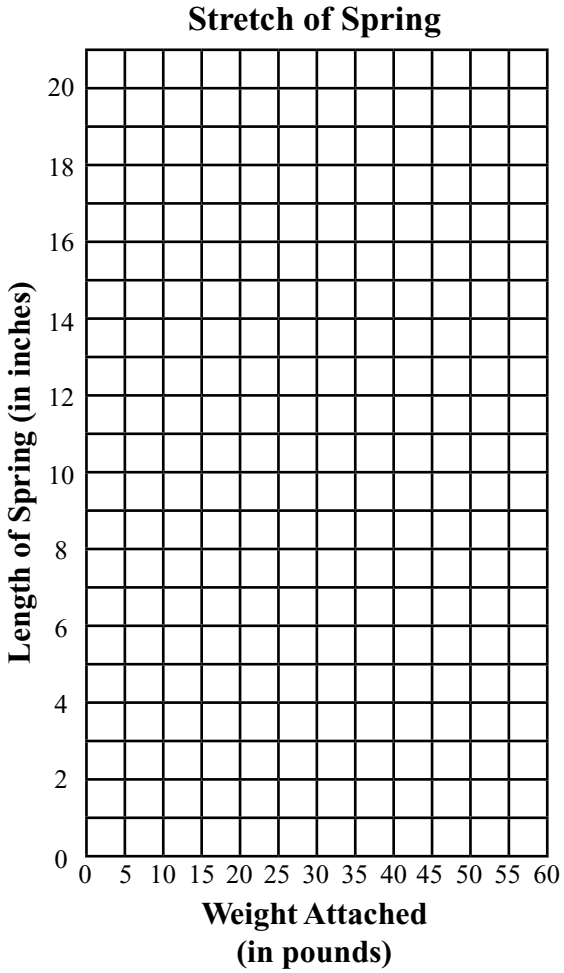
a. Explain how the length of the spring is related to the amount of weight attached.

b. Which of these quantities depends on the other?

Your teacher will give you a copy of the chart below and the grid at right to use for parts c, d and e.

c. Complete the chart your teacher gave you to represent the information from the pictures.

Weight Attached (in pounds)	0				
Length of Spring (in inches)	7				



d. In your grid, plot a point to represent each pair of numbers in the chart.

e. Connect the data points from left to right. Explain why you chose a solid or a dotted path.

f. How long would the spring be if 20 pounds of weight were attached to it?

Continued on the next page.

g. How much weight would have to be attached to the spring in order for it to be 1 foot long?

h. Complete this sentence: For each _____ pounds of weight attached, the spring stretches _____ inches.

i. Is this rate of stretch a steady, or constant, rate? What do you see about the graph that indicates a constant rate?