MathStars
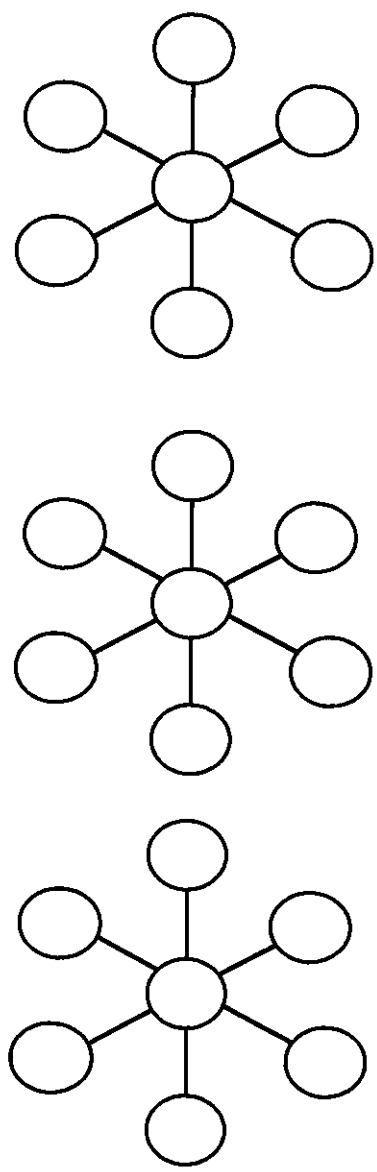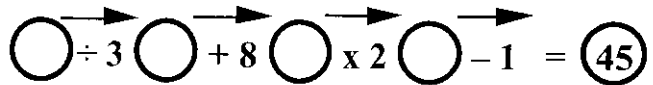
★ 1. What number could be added to 150 so that the sum would be between 500 and 525?

Answer: _____

★★★★ 2. Find three ways that the sum of three digits in a line equal 17. Don't repeat the digits within a design.

★★★ 3. If you begin with a certain two-digit number and follow the arrows, you will end with 45.

$$\bigcirc \div 3 \; \bigcirc + 8 \; \bigcirc \times 2 \; \bigcirc - 1 \; = \; \boxed{45}$$

Strategy of the Month

Someone said, "A picture is worth a thousand words." Turning the words of a problem into a picture or a diagram can help you "see" the problem. By using the part of your brain that visualizes a situation or object, you may see relationships or information that helps you solve the problem. When someone tells you a story, try turning the words into a motion picture or a cartoon. When reading a description, try "seeing it in your mind's eye." If you can do these things, this strategy may be for you! Try using a picture or make a diagram to solve this problem:

Every bike slot in a bicycle rack was filled. Donna's bike was in the middle. There were six bikes to the right of Donna's. How many bicycles were in the bicycle rack?

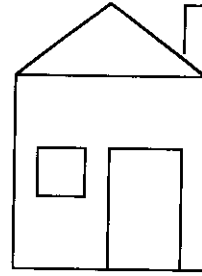★★ 4. How can you remove two toothpicks from the square shape below and leave two squares of dfferent sizes? Cross out the two that should be removed.

★★★ 5. Miss Black's class began a stem and leaf graph of the following data. Complete the graph.

Number of organisms in each person's square foot of space on the playground.

1	1, 7
2	0, 1, 2

28, 29, 17, 21, 36, 20, 33, 11, 22, 33, 35, 41

★★★ 6. John is twice as old as his sister Mary. Mary's age is 1/6 the age of her mother. Their mother is 30. How old are John and Mary?

John _____ Mary _____

★★ 7. Find all the right angles on the house below. Put a square on each one like this:

★★ 8. Use the digit **8** four times to make **89**.

★★★ 9. Place the other letters of the alphabet above or below the line given below using the same rule that was used for **A** through **I**.

A　　　**E F**　**H I**
_____
　　B C D　　**G**

MathStars

★★★ 1. What is the volume of the solid figure below? If the outside were painted blue, how many cubes would have only three sides painted blue?

_____ cm³ is the volume
_____ cubes are painted blue on three sides
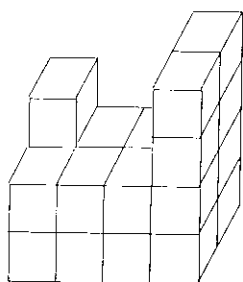
★★★ 2. Principal Greene orders pencils for the school store by rounding the number of students in each grade to the nearest 10 and doubling that number. What is the total number of pencils he will order?
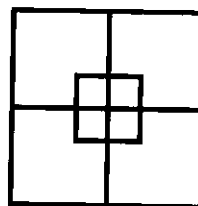
Answer: _____ pencils

Grade	K	1	2	3	4	5
# of students	87	94	97	78	72	84

★★ 3. A digital clock shows either three or four digits. At what time do the digits have the greatest sum?

★ 4. How many squares are in the figure below?

Answer: _____ squares

★★ 5. Three friends shared some cookies. They each got two and two-thirds cookies. How many cookies did they have altogether before they divided them?

Strategy of the Month

*Your brain is an organizer. It organizes information as it stores that information. When a problem involves many pieces of information, your brain will have an easier time sorting through it if you make an organized list. A list helps you be sure you have thought of all of the possibilities without repeating any of them. Like drawing a picture or making a diagram, making an organized list helps your brain "see" the problem clearly and find a solution. Try **making an organized list** to solve this problem:*

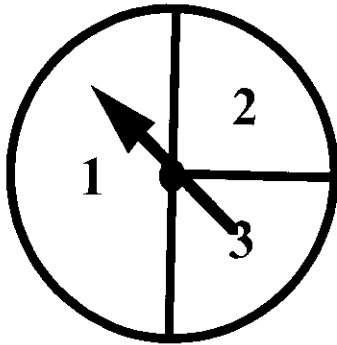If you must use 15 or fewer coins, how many different combinations of coins can be used to make $1.00?

★★★★   6. Given y is two times x, z is three times x, and $x + y + 3z = 12$. What are the values of x, y, and z?

$x =$ _____ $y =$ _____ $z =$ _____

★★   7. On this spinner, the probability of getting a one is 1/2 or 1 out of 2. What is the probability of getting a 2?

★★   8. Circle the whole number below that is closest to the sum of these numbers:
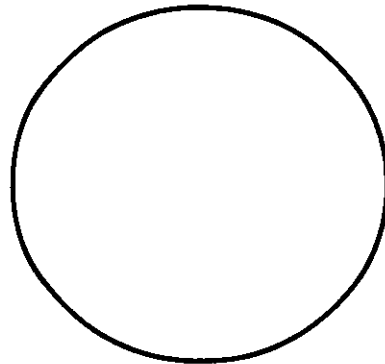
$$2\frac{1}{73} + 6\frac{40}{44} + 8\frac{3}{58} + 1\frac{15}{17} =$$

17   19   21   23

★★★   9. Katie gave a number problem to Jenny. She told her to pick a number, double it, add 10 to it, and then subtract 2. Jenny's answer was 34. What number did Jenny pick?

Answer: _____

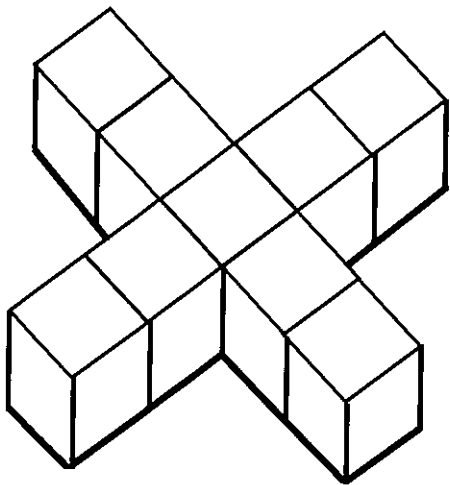★★★   10. Show how you could divide a circle into 11 pieces using only 4 straight lines.

★★★ 1. Nine cubes form to make an **X**. If the complete figure is painted red, how many cubes have exactly four faces painted red? How are the remaining cubes painted? Write on each cube the number of its faces that are painted.

★★★ 2. November 8 is on Wednesday. Gary's birthday is in November. This year his birthday is on a weekend. The date has two digits. You say the date when you count by twos. The sum of the digits is 8. What is the day and date of Gary's birthday?

Day of the week _____

Date _____

★★ 3. Lila saw a shirt on sale at 25% (1/4) off. It's original price was $12. How much is the shirt now?

★★★ 4. On a 20 question math test, your teacher gives you five points for every correct answer and takes away one point for each incorrect answer. If you score 70 on the test, how many did you get correct?

Answer: _____ correct

Strategy of the Month

Being a problem solver is something like being a detective! A detective has to solve crimes by guessing what happened and checking the guess to see if it fits the situation. For some problems, your best strategy may be to make a guess and then check to see if your answer fits the problem. If not, decide if your guess was too high or too low and then make a second "guesstimate." A good detective keeps records (usually some kind of chart) to help see any patterns and to narrow down the possibilities. You should do this too. The results of incorrect guesses can give you valuable clues to the correct solution. **Guess and then check** *the solution to this problem:*

I am a 2-digit number over 50. When you put me in groups of 7, 2 are left over. The sum of my digits is 11. What number am I?
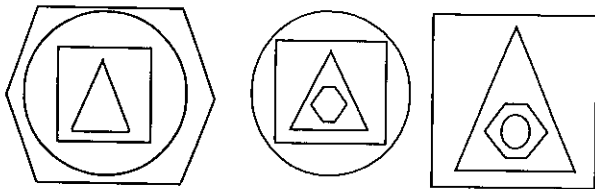
★★ 5. What would the next shape look like? Draw it on the line.

Answer: _____

★★ 6. Allison's mom baked five pies for her birthday party. Each person who came to the party ate one piece, and all the pieces were the same size. The pies that were left over are shown below. How many people came to the party?
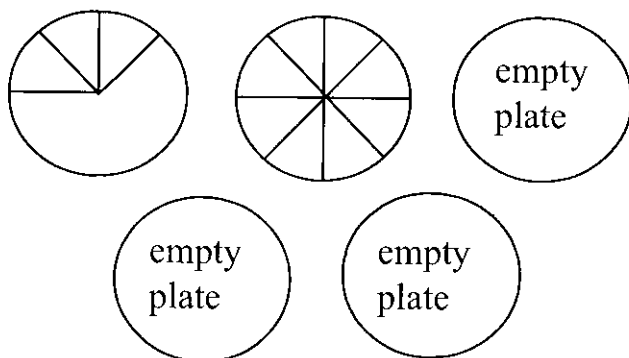
Answer: _____ pieces

★★★★ 7. The pictures below all show the same block, but seen from a different view each time:
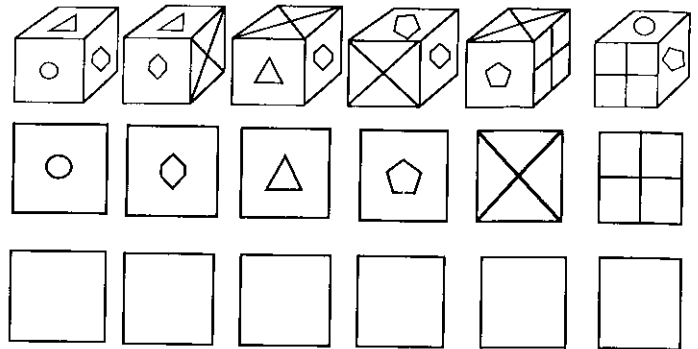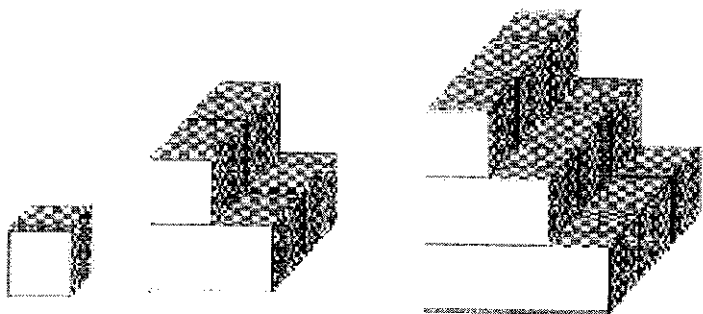

Draw the design that is opposite these sides.

★ 8. It's now 12:10 p.m. What time was it 15 minutes ago?

Answer: _____

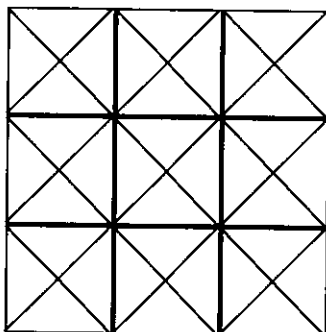★★★★ 1. How many cubes will it take to build the next figure in the pattern below?
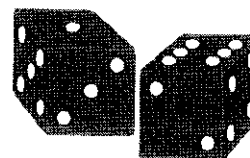

★★ 2. At Henry's Restaurant, a customer gets a free lunch after paying for six. Caroline ate lunch at Henry's 50 times last year. How many of those 50 lunches were free?

★★★ 3. Color the square below so that 50% is red, 25% is green, and 25% is yellow.

★★★ 4. Which sum is most likely to be rolled on a pair of dice, 3 or 7?

_____ is most likely. Why would this be true?

★ 5. What fraction of the letters in the word MULTIPLY are also in the word PRODUCT?

Strategy of the Month

*Noticing patterns helps people solve problems at home, at work, and especially in math class! Math has been called "the study of patterns," so it makes sense to look for a pattern when you are trying to solve a problem. Recognizing patterns helps you to see how things are organized and to make predictions. If you think you see a pattern, try several examples to see if using the pattern will fit the problem situation. Looking for patterns is helpful to use along with other strategies such as make a list or guess and check. How can **finding a pattern** help you solve this problem?*

If the first day of a year is a Friday what day of the week is February 19 of the same year?

★★ 6. This recipe makes four servings of lemonade. How many lemons are needed to make ten servings of lemonade?

LEMONADE

2 lemons
2 quarts of water
1/2 cup of sugar

Squeeze lemon juice into a pitcher. Add water and sugar. Stir well and pour over ice.

★★★ 7. Sam and Sue have only nickels and dimes. Sue has 35¢. Sam has the same number of dimes as Sue has nickels, and he has half as many nickels as Sue has dimes. How many nickels does Sue have?

★★ 8. There are 12 pages in Bill's football card album. Each side of the page holds 12 cards. When his book is half full, how many cards will Bill have collected?

★★★ 9. If you must use two quarters and a total of 8, 9, or 10 coins, how many different combinations of coins can be used to make a dollar? Use the table below to find your answer.

# of coins	Quarters	Dimes	Nickels	Pennies
8				
9				
10				

★★★ 10. A cereal company puts a 10¢ coupon in every other box of cereal it packages. It puts a pencil in every fifth package and a coupon for a free hamburger in every eighth package. Out of the first 100 boxes, how many will have all three items: a 10¢ coupon, a pencil, and a free hamburger coupon?

★★ 1. Draw a picture of what the tetromino would look like after it is turned or rotated 90 degrees.

Before 90 degree turn   After 90 degree turn

★★★★ 2. Find the products of the following problems. Look for a pattern in the products. Write a rule for the product. Do you think it will always work?

```
   44          23          32
  x11         x11         x11
```

Rule: _____

★★ 3. Fill in the missing numerals.

_____ x _____ x 2 = 42
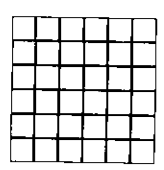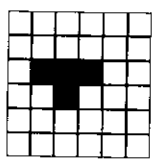
★★ 4. If the area of each small square is 10 centimeters, what is the area of the entire figure?


Strategy of the Month

*Sometimes mathematical ideas are hard to think about without something to look at or to move around. Drawing a picture or using objects or models helps your brain "see" the details, organize the information, and carry out the action in the problem. Beans, pennies, toothpicks, pebbles, and cubes are good manipulatives to help you model a problem. You can use objects as you guess and check or look for patterns. Try **using objects** to help you solve this problem:*

Twenty-seven cubes are placed together to make a large cube that is painted on the outside. How many small cubes will have 2 and only 2 faces painted?

★★★ 5. Below is a map of Centerville. Use it to answer the questions below it.
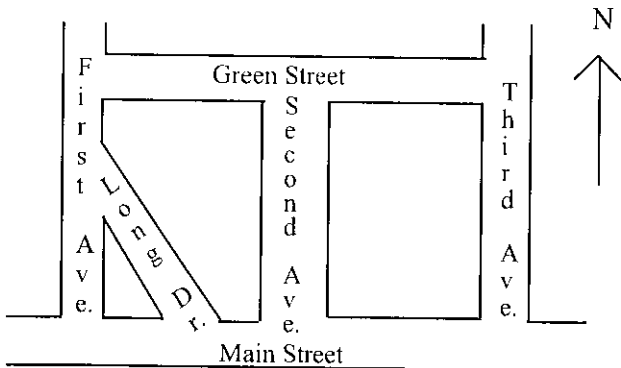
Name a road that is perpendicular to Main Street

_____

Name a road that is parallel to Main Street

_____

If you drove east on Main Street, which way would you turn to enter Second Avenue?

_____

★ 6. Complete the following to make a true subtraction example.

$$\begin{array}{r} 4\ 0\ 6\ \square\ 9 \\ -\ \square\ 2\ \square\ 9\ 8 \\ \hline 1\ 8\ 0\ 3\ 1 \end{array}$$

★★★ 7. List the possible pizza combinations Mary Beth can pick that have only one topping. List the combinations using letters. The first one is done for you.
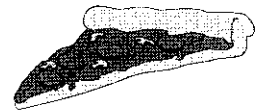
Size	Crust
A. small	D. thick
B. medium	E. thin
C. large	F. pan

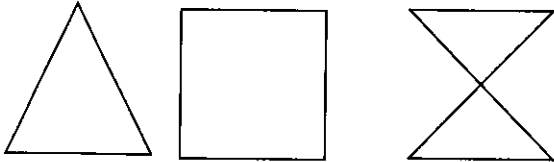| Toppings |
|----------|
| G. cheese |
| H. pepperoni |
| I. hamburger |

Possible combinations: ADG,

★★★ 8. There are five people at a meeting. If each person shakes hands with each of the others once, how many handshakes are exchanged?
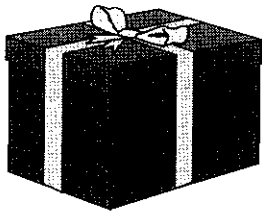
★★★ 1. Show how the shapes below can be divided into four congruent triangles.

★★ 2. Julie wants to order a present from a catalog for Marcie's birthday on April 14. If delivery takes four weeks, what is the latest date she can order the present for it to arrive on the 14th?
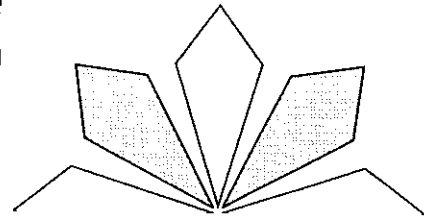
★ 3. What is missing in this pattern?

$$\frac{2}{5}, \frac{4}{10}, \frac{6}{15}, \underline{\quad}, \frac{10}{25}$$

★★★ 4. One section of a book contains five pages. The sum of all the page numbers in the section is 125. What are the page numbers?

_____, _____, _____, _____, _____

★★★ 5. The drawings below are erased at their line of symmetry. Complete the drawings by drawing the missing parts.

Strategy of the Month

*When a problem involves data with more than one characteristic, **making a table, chart, or graph** is a very good way to organize the information. It helps your brain to identify patterns and to discover any missing data. Tables help you record data without repeating yourself. Making a table or chart is especially useful for certain problems about probability and for some logic problems. Sometimes tables and charts are included in your information and you need to read through them carefully to understand the data you need to solve your problem. Creating a graph is also a good way to organize and visualize information. Make a table to solve this problem:*
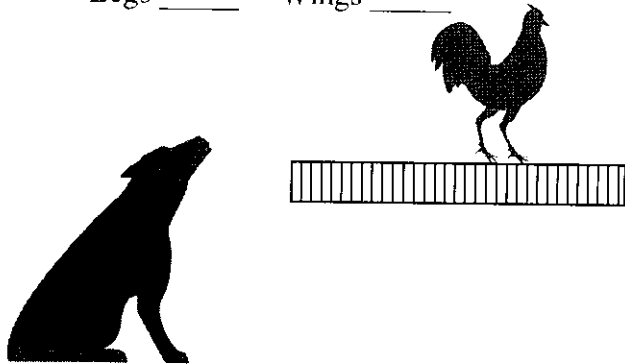
A school cafeteria sells popsicles for 50¢, nutty buddies for 80¢, and ice cream sandwiches for 60¢. If a student spent $6.00 in May for frozen snacks, what could the student have purchased?

★★★ 6. Old MacDonald had a farm. On this farm he had 3 ducks, 15 chickens, 4 mice, 17 cows, 5 horses, and 2 dogs. How many legs and wings were on his 46 animals?

Legs _____   Wings _____

★★★★ 7. Roy bought a ball that bounces exactly half the height from which it is dropped. He drops it from the top of a building that is 30 meters tall. How high will the ball bounce after it's fourth bounce? You may choose to use a calculator for this one.

30 m.

Height?
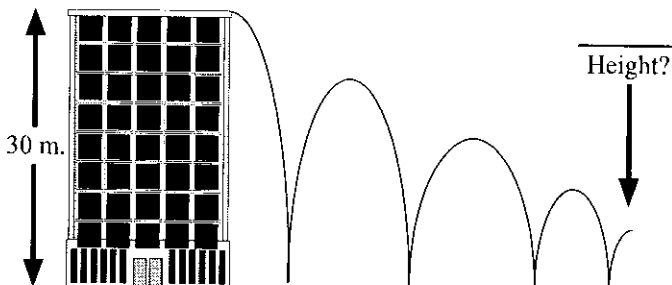
★★ 8. Circle the figures below which would fold up into a cube if you cut them out and folded on the lines shown. You might draw these and practice folding to check your answer.
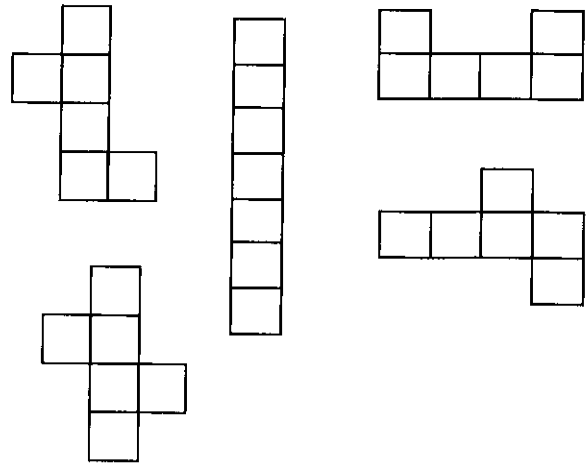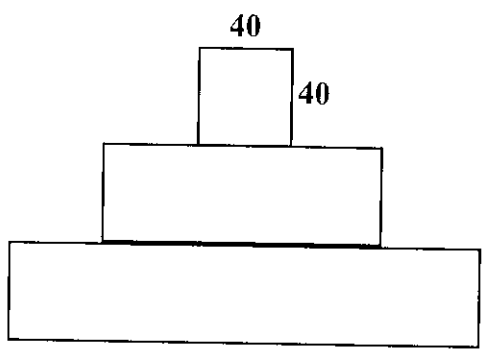
★★ 9. This quadrilateral has two diagonals. What polygon has 20 diagonals?
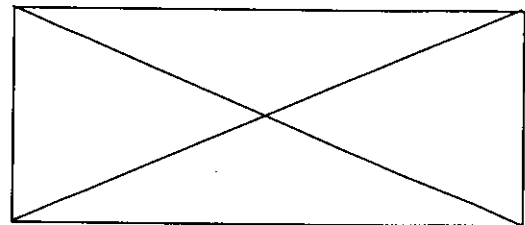
MathStars

★★★ 1. Label each line segment with its missing length. Two are given for you.

```
        40
       ____
      |    | 40
   ___|    |___
  |            |
 _|_____|_
|                |
|_____|
```

★★★★ 2. Students made a line plot of the number of pets they had at home.

```
        X
X       X       X
X       X       X       X       X               X
X       X       X       X       X       X       X
_____
0       1       2       3       4       5   6   7
```
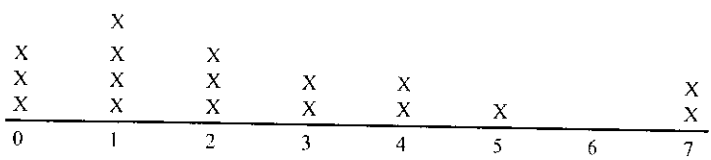
How many pets are there altogether? _____

What is the median number of pets? _____

What is the mode? _____

How many students participated in this survey?

_____

★★ 3. Farmer Greene is building a fence. He places 15 fence posts 8 ft. apart. What is the distance from the first fence post to the last?

★★★ 4. If you write the numbers from 1 to 99, how many times would you write the digit 1?

Strategy of the Month

Some problems are difficult to "see" even if you draw a picture. For these problems, it can be helpful to actually act out the problem. When you role-play with friends or people at home, you may discover the solution as you act out the problem. Or you may recognize another strategy that will help you find the answer. Sometimes "acting out" a problem can be done with manipulative materials. To find ithe solution to the problem below, become the director and choose your cast to act this out:

There are four boys in the Grant family. Alex is older than Terry and younger than Stuart, Ross is not the oldest or the youngest. Alex does not have two older brothers. Write the names of the boys from oldest to youngest.

★★ 5. Jesse wants to make a pot of tomato soup that holds eight bowls. To make two bowls, he needs two tomatoes, 1 1/2 cups of milk, and 1/2 teaspoon salt. How much of each ingredient will he need for his pot? Jesse made a drawing to help him figure this out. What would his drawing look like?

Tomatoes ___ Milk ___ cups Salt __ teaspoons

★★★ 6. In the problem above, how much of each ingredient would Jesse need if he were making 80 bowls of soup?

Tomatoes ___ Milk ___ cups Salt __ teaspoons

★ 7. In a fourth-grade class, two out of four students bring their lunches to school. There are 28 students in this class. How many students in the class bring their lunches to school?

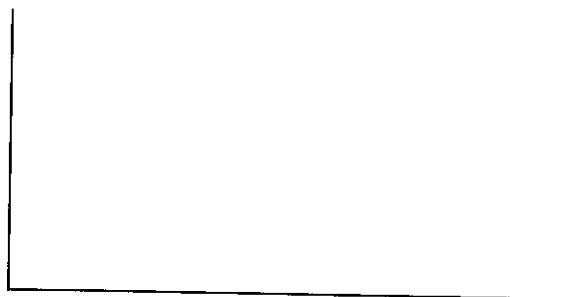★★★ 8. Round off each amount to the nearest dime.

$.59 _____ $.46 _____ $.21 _____

$.68 _____ $.74 _____ $.87 _____

★★★ 9. It takes Jerry 12 steps to go across the classroom. It takes Mary 16 steps. If Jerry has taken nine steps, how many steps has Mary taken?

Math*Stars*

★★★ 1. Hop in place for 10 seconds while counting the number of hops. Wait 5 seconds and repeat. Record the number of hops for 5 trials. Make a bar graph of the results; be sure to title and label your graph.

★★ 2. Mary is ironing shirts for her father. He pays her 50¢ for the first shirt and increases her pay by 25¢ per shirt. How many shirts will she have to iron to earn $5.00?_____

★★★★ 3. Sam, Nancy, Becky and Jimmy all eat lunch in the same restaurant. All of them are eating there today and Sam eats there every day. Nancy eats there every other day, Becky eats there every third day and Jimmy eats there every fourth day.

The next time they are all together in this restaurant they will have a big celebration. How many days from today will the celebration take place? _____days.

★★ 4. Fill in the chart:

Number A	Number B	Sum	Product
		15	36
	3		27
9		21	

Strategy of the Month

*What do you do if you have a problem that seems to be very complicated? It may have a lot of large numbers, too much information, or multiple conditions. One approach is to create a simpler problem like the one you need to solve. As you solve the easier problem, you may see the way to solve the more difficult one. Or you may discover a different process that will work with the harder problem. The trick is to be sure that your simpler problem is enough like the original one that the patterns or process you use will help you with the harder situation. **Make a simpler problem first as you solve this:***

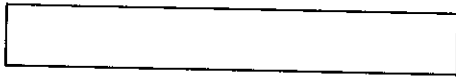The pages in a book are numbered from 1 to 256. How many times is the digit 4 printed?

★★   5. Jordan plans to cut a board into equal-sized pieces by making 12 cuts in the board. There will be a 10-inch interval between cuts. How long is the board?

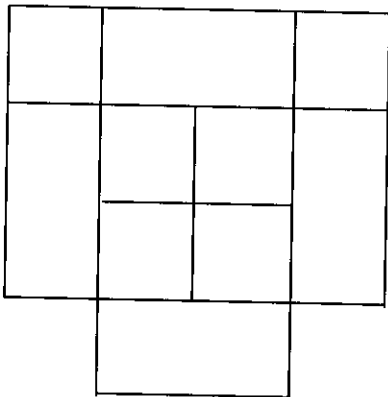★★★   6. List the amount of each of the ingredients if the following recipe is tripled.

PLAY DOUGH

Mix together:
     1 1/2 cups flour
     1 1/3 cups water
     1 1/4 tsp. cream of tartar
     3/4 Tbsp. oil

Cook at medium heat until it turns solid.

★★   7. How many different squares are in this picture?
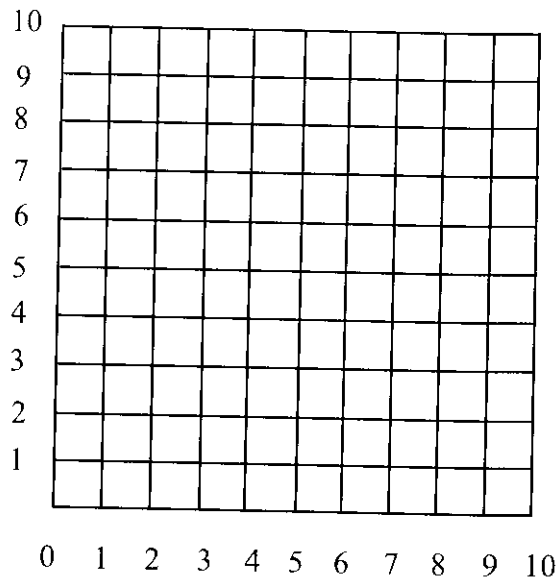
★   8. What is the closest estimated answer to this problem?

$$4\ 3$$
$$+\ 8$$
$$5\ \ 9$$

a. 12,000
b. 13,000
c. 14,000

★★   9. Begin at (9,6) to find a mystery dot-to-dot picture. Draw it by connecting in order with straight line segments the points having the given coordinates.

(9,6) (1,6) (8,1) (5,9) (2,1) (9,6)

★★ 1. Record these grades on a stem and leaf plot. The first one is done for you.
95, 83, 76, 99, 93, 92, 93, 88

$$7 \mid 6$$

What grade is the mode?_____

★★★★ 2. ✔, ☼, ▲, and ✳ each stands for a digit. Find what each stands for using these clues:

✳ ✔	☼	✔	✳
+ ☼ ▲	+ ▲	+ ▲	+ ▲
6 1	9	11	8

✔ = _____

☼ = _____

▲ = _____

✳ = _____

★★★ 3.

Mercury = ●   Earth = ●   Sun = ○

Mercury takes 88 earth days to go around the Sun. About how many times does Mercury revolve around the sun in one earth year?_____

★★ 4. Shemeka owns a guitar store. She is buying new strings to put on her guitars. She has 9 guitars that need 6 strings each. She has 4 guitars that need 12 strings each. Each string costs $1.65.

A. How many strings does Shemeka need to string her guitars?_____

B. How much will all these strings cost?_____

Strategy of the Month

*What if you know the result of a situation, but you don't know the beginning? For example, you might know that you end up with thirteen baseball cards after doing a certain number of trades and you want to figure out how many cards you had before the trading started. In that case you need to work backwards; you have to think about your actions in reverse order. This strategy works for any sequence of actions when you know the end result rather than the starting place. Try **working backwards** to solve this problem:*

Jo gave a number problem to Nelda. She told her to pick a number, add 10 to it, double that sum, and then subtract 5. Nelda's answer was 39. What number did she start with?

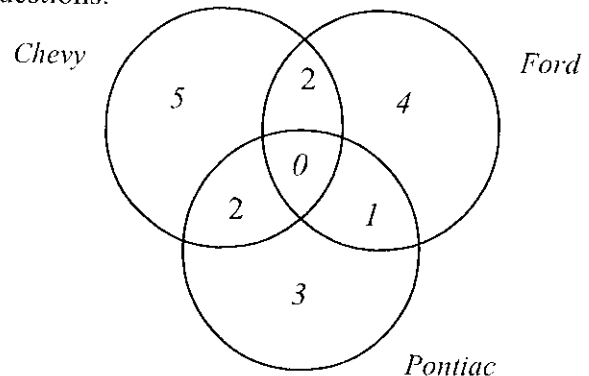★ 5. Mental Math: Add the even numbers *between* 2 and 14. Put your answer in the circle.
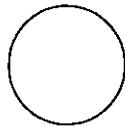
★★ 6. Draw line segments to show these parts.

HALVES THIRDS QUARTERS SIXTHS
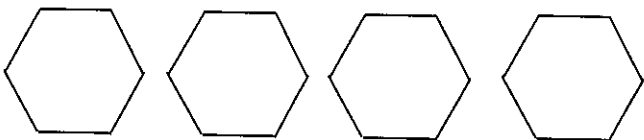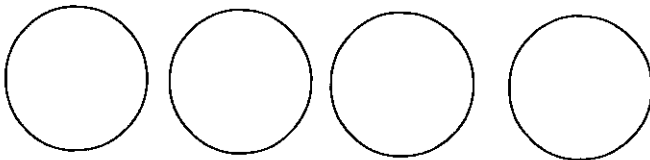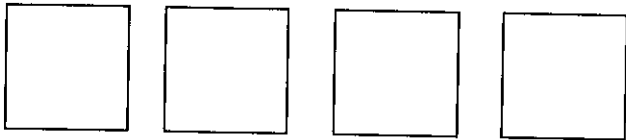
★★★ 7. The students in Ms. Ortega's class took a survey to find out about their favorite race cars. Then they made a Venn diagram of this information. Use the Venn diagram to answer the questions.

How many in the class like only Chevys?_____

How many like Fords?_____

How many like all three?_____

★★★ 8. Michael Jordan scored 39 points against the Knicks in one game. He didn't score any foul shots. Find 6 combinations of 2- and 3-point shots he could have made; he did score at least one of each shot. Fill in the table below to organize your answers.

TWO-POINT SHOTS	THREE-POINT SHOTS

★ 1. Place the missing digits in the boxes below.

```
    3,☐ 8 6
      1 ☐ 2
  +☐, 6 7 ☐
  ─────────
    8, 1 5 5
```

★★ 2. Nine years ago a 10-ounce candy bar cost 25¢. That same candy bar costs twice as much now. How much does the candy bar cost per ounce now? _____

★★ 3. Use the Tangram puzzle below. Suppose the square costs 10¢, how much will the other pieces cost? Put your answers inside each piece.
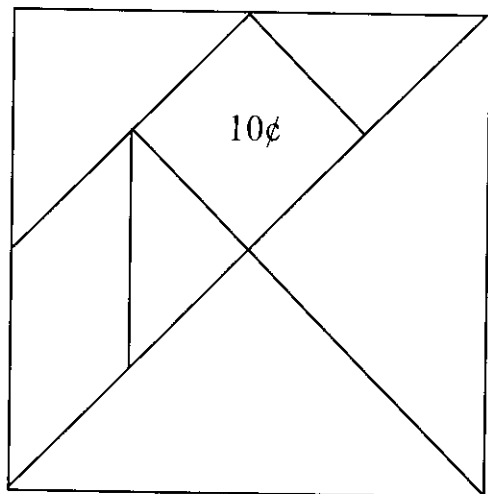
★★★ 4. Draw the missing shapes in the boxes below.

Strategy of the Month

*What if you know the result of a situation, but you don't know the beginning? For example, you might know that you end up with thirteen baseball cards after doing a certain number of trades and you want to figure out how many cards you had before the trading started. In that case you need to work backwards; you have to think about your actions in reverse order. This strategy works for any sequence of actions when you know the end result rather than the starting place. Try **working backwards** to solve this problem:*

Jo gave a number problem to Nelda. She told her to pick a number, add 10 to it, double that sum, and then subtract 5. Nelda's answer was 39. What number did she start with?
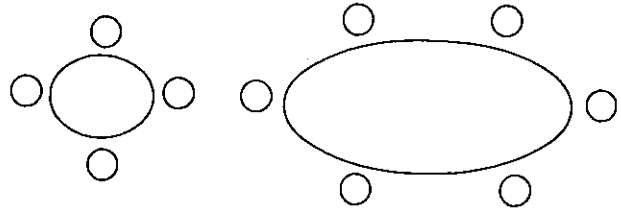
★★★   5. Copy the drawing below using the given grid.
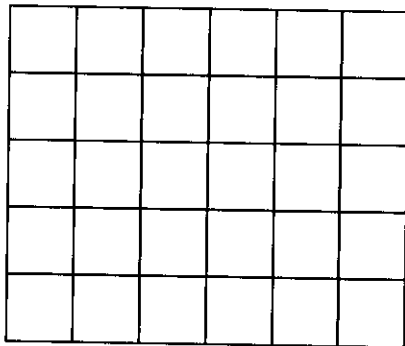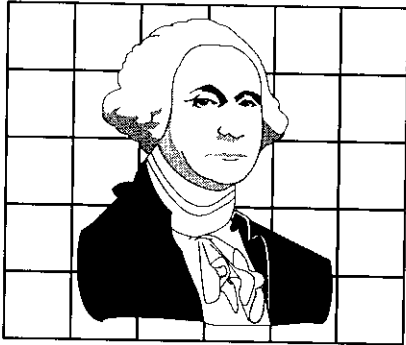
★★★★   6. In the school library 26 students can sit at the 5 tables with no empty seats. There are small tables for 4 people and large tables for 6 people.
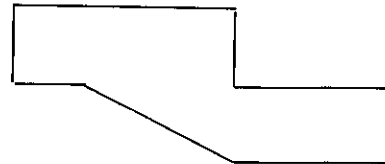
A. How many small tables are in the library?_____

B. How many large tables are in the library?_____
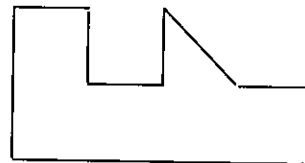

★★★ 7. For each figure below circle the best estimate of the area of the figure. Hint: Place some cm² graph paper over the figure or "draw in" some square centimeters.

A. 4 cm²
B. 5 cm²
C. 6 cm²

A. 4.5 cm²
B. 5.5 cm²
C. 6.5 cm²