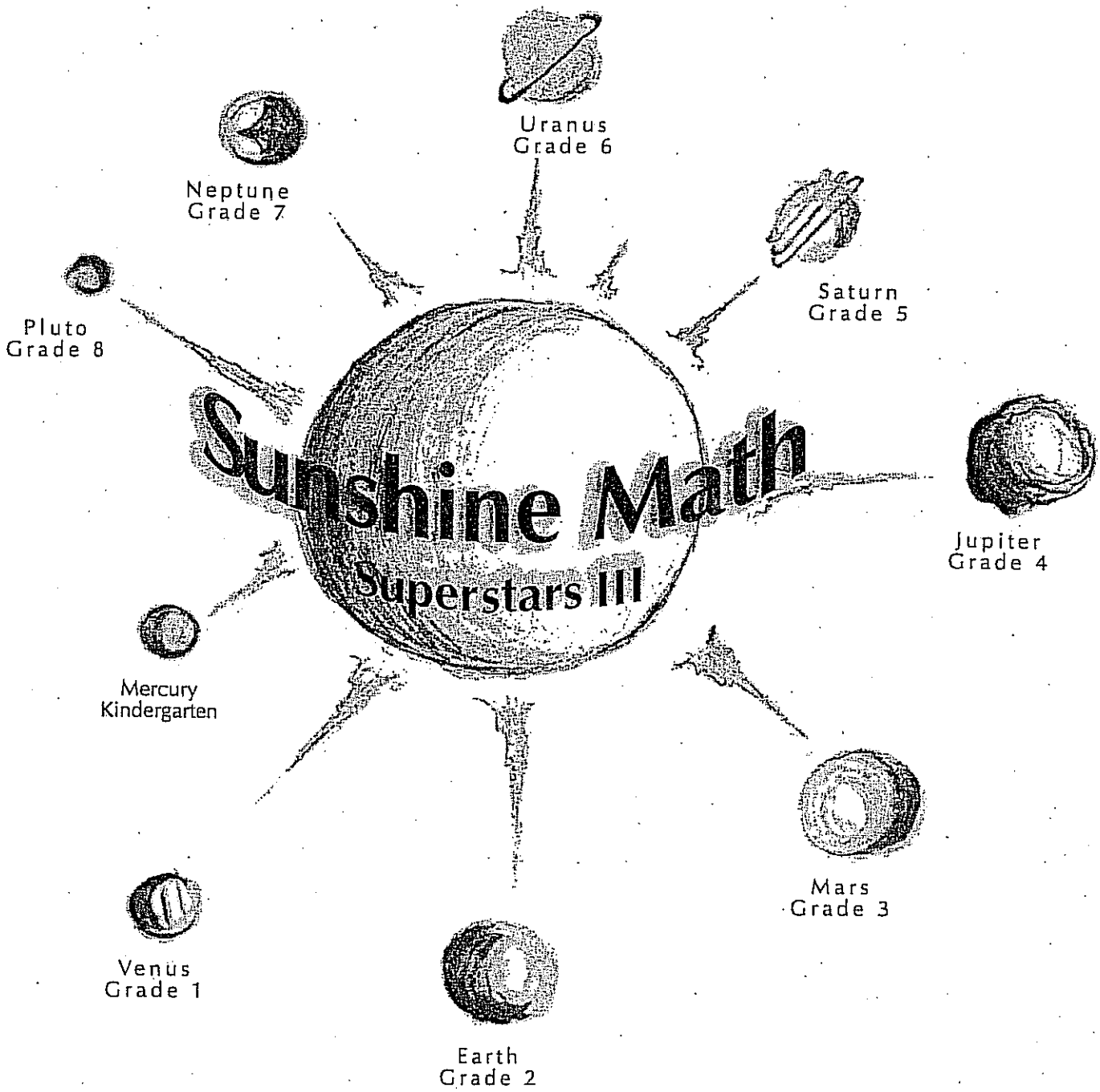

Pluto
Grade 8

Acknowledgments

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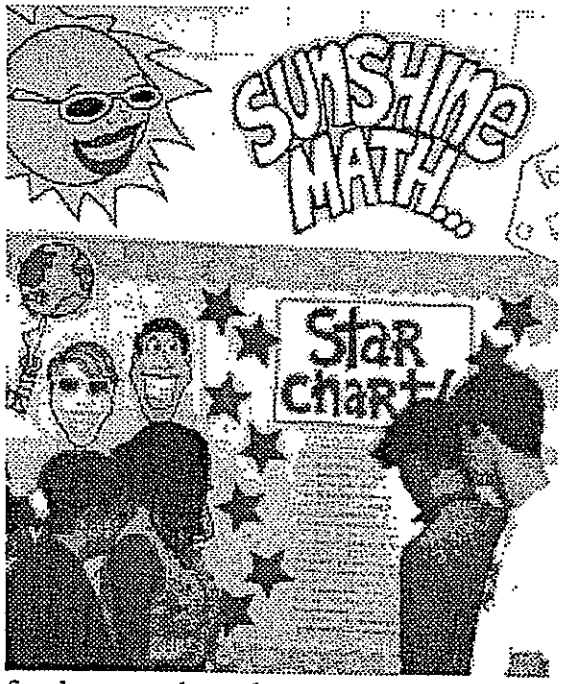
Additional copies of *Sunshine Math* may be purchased at cost from the Panhandle Area Educational Consortium (PAEC), 753 West Boulevard, Chipley, Florida 32428, or by contacting the PAEC Distribution Center:

PHONE: (850) 638-6131,
SUNCOM: 769-6131.
TOLL-FREE: (877) 873-7232
FAX (850) 638-6336

Preface

Sunshine Math and its predecessor programs, *Superstars* and *Superstars II,* dwell on the positive aspects of students, parents, teachers, and administrators working together. This program assumes that children, even young children, are capable of and interested in learning; that teachers want to help them learn to think for themselves; that administrators see their jobs as clearing the path so that quality education is delivered effectively in their schools; and that parents care about their child's learning and are willing to work with the school system toward that goal. Each of these four groups has a vital role to play in implementing *Sunshine Math.*

The program's initiators believed that elementary students are capable of much more than we normally ask of them, and the subsequent success of *Superstars* indicates that many children are on the path to becoming independent learners. A number of children in *any* classroom are bright, energetic, and willing to accept extra challenges.



The basic purpose of the *Superstars* program is to provide the extra challenge that self-motivated students need in mathematics, and to do so in a structured, long-term program that does not impinge on the normal classroom routine or the time of the teacher. The system is not meant to replace any aspect of the school curriculum -- it is offered as a peripheral opportunity to students who identify with challenges and who want to be rewarded for their extra effort. Participation in the program is always optional -- only those students who voluntarily choose to participate will, in the long run, benefit from this program. Any student, regardless of prior academic performance, should be encouraged to participate as long their interest is maintained.

The predecessor programs for *Sunshine Math* - the Florida Department of Education's *Superstars II* and *Superstars*-- have demonstrated that this concept can be extremely successful. What is required are several dedicated adults who devote a few hours each week to operate the system effectively in the school; an administrator who provides highly visible support; teachers who welcome a supplementary experience for their students to engage in higher-order thinking; and a typical classroom of students. If all of those ingredients are present, *Sunshine Math* will become an integral part of the school fabric.

ORGANIZATION OF THESE MATERIALS

Section I **Description of the *Sunshine Math* Program**

1. General Information
2. Information/ checklist for principals
3. Information/checklist for assisting adults
4. Information for teachers
5. Letter to participating students and their parents

Section II **Student worksheets for *Sunshine Math***

Section III **Commentary for student worksheets for *Sunshine Math***

Sunshine Math General Information

Sunshine Math is a K-8 program designed as an enrichment opportunity for self-directed learners in mathematics. The levels of the program are named after the planets of our solar system:

Kindergarten	Mercury	Fifth Grade	Saturn
First Grade	Venus	Sixth Grade	Uranus
Second Grade	Earth	Seventh Grade	Neptune
Third Grade	Mars	Eighth Grade	Pluto
Fourth Grade	Jupiter		

Students of all ability levels choose on their own to participate in *Sunshine Math*. The visual reinforcement of seeing their names displayed in a prominent place in the school, with a string of stars indicating their success, is the reward a student receives for the extra work. In many cases, the school decides to enhance the basic reward system by awarding certificates or other forms of recognition for achieving certain levels of success in *Sunshine Math*.

Sunshine Math can function in a school in a number of different ways. The "tried and true" way is for assisting adults (volunteers, aides, etc.) to manage the program for the entire school, with support provided by school administrators and classroom teachers. This system has been modified at the school level, with varying degrees of success, over the years. The basic model for running *Sunshine Math* is discussed below, with variations described on the next page.

The Basic Model

The basic model for *Sunshine Math* is for a school to establish a weekly cycle early in the fall, according to these guidelines:

> On Monday of each week, student worksheets are distributed by the assisting adults to those in the program. Students have until Friday to complete the problems, working entirely on their own. On Friday, the classroom teacher hosts a brief problem-solving session for the students in the program. The more difficult problems on the worksheet for that week are discussed, with students describing their thinking about how to approach and solve the problems. They do not give their answers for the problems, only their strategies.
>
> Students get double-credit for problems they complete prior to the problem-solving session, and regular credit for those they complete successfully over the weekend. On Monday, all papers are handed in, checked by the assisting adult, and stars are posted for problems successfully worked. This completes the cycle for the preceding week, allows for the new worksheets to be passed out, and the cycle begins again.

Sunshine Math is not for every child -- it's only for those who are self-motivated and who are not easily frustrated by challenging situations. This does not diminish the value of the program, but rather makes us realize that there are children of all ability and socio-economic levels who are self-directed learners and who need challenges beyond those of the regular school day. These children will shine in *Sunshine Math*.

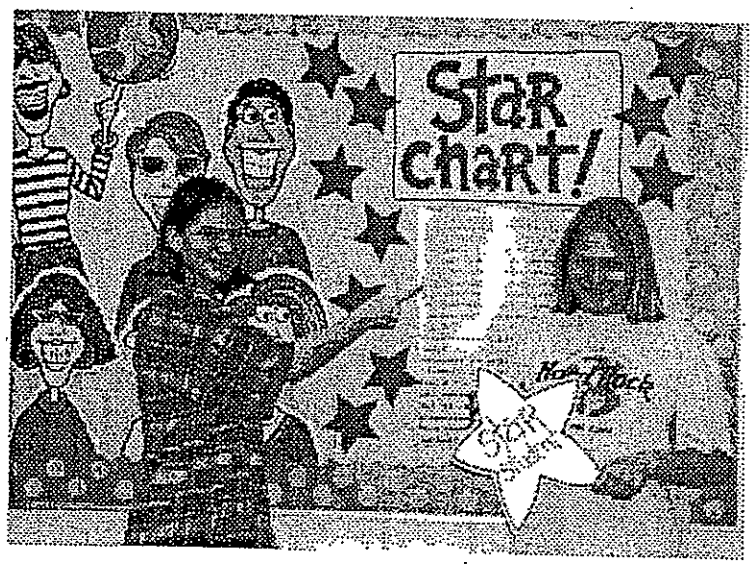
Variations of the Basic Model

The first variation that has been used successfully retains the weekly cycle and assisting adult role as in the basic model. However, the teacher involves the entire class in the problem-solving discussions. For example, the teacher might pick the four hardest problems on the worksheet for that week, and do a "parallel problem" with the entire class to open the mathematics class on Tuesday through Friday. Using this variation, all students are exposed to the problem-solving strategies, but only those who are in *Sunshine Math* exhibit that they have learned the material by completing the worksheet over the weekend.

A second variation is for the assisting adults to run the entire program, including the problem-solving session for students. This method has been used in situations in which some teachers in a school lacked commitment to the program, and thus it was being implemented inconsistently. In such cases, the assisting adults must have a progressive view of what constitutes problem solving in elementary mathematics. They must also be given extra assistance from the principal to ensure students are released from class and that the process works smoothly in general.

Yet another variation is for a parent to run *Sunshine Math* at home, for their own child. The basic rules are the same -- a child gets the worksheet once a week and time to work the problems alone. The parent has a pre-established night to listen to the way the child thought about each problem, interjecting her or his own methods only when the child seems stuck. The reward system is basically the same -- stars on a chart -- but is usually enhanced by doing something special for the child, such as a trip to the movies or to the skating rink, when the child reaches certain levels of success. If this method is adopted, the parent must be sure not to try to "teach the child." *Sunshine Math* is a program designed to stimulate discussion of problem-solving strategies; it is not a program designed for adults to "teach children how to think."

Other variations abound. The basic model on the previous page is the approach that reaches more children in a consistent fashion than any of the other methods. However, individual schools, teachers, or parents are encouraged to get some version started, even if it's not one of the above. Some sunshine is better than none at all!



Sunshine Math: Information for Principals

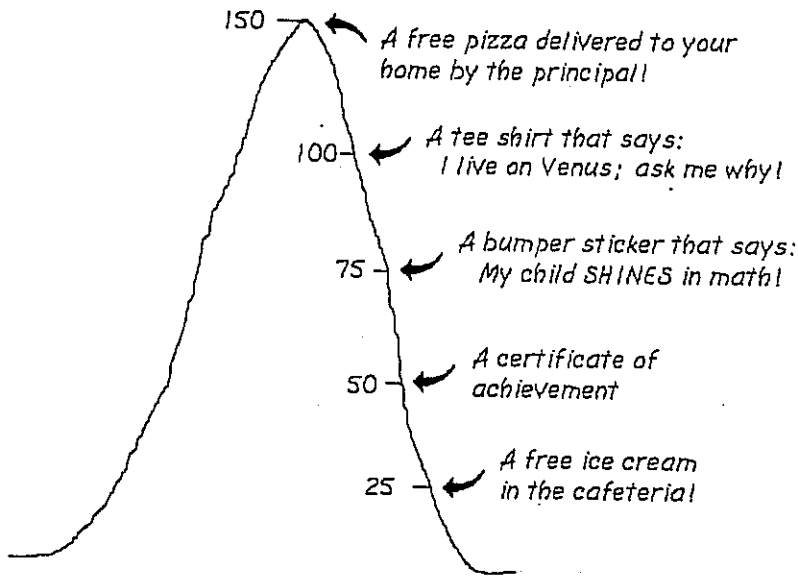
Sunshine Math is a K-8 enrichment package for mathematics, designed to be managed by volunteer assisting adults with coordinated support from the classroom teacher and school administrators. The purpose of the program is to give self-motivated students of all ability levels a chance to extend themselves beyond the normal mathematics curriculum. The complete set of materials comes in nine packages, one for each K-8 grade. The grade levels are named for the planets in the solar system, in order starting from the sun: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, and Pluto.

Your support is vital if this program is to succeed. As the school administrator, you need to stay in close touch with *Sunshine Math*. A "checklist for success" follows:

- ☐ Become familiar with the philosophy and component parts of the program.
- ☐ Introduce *Sunshine Math* to the faculty early in the school year. Ensure that each teacher understands the philosophy of the program and has a copy of the student worksheets and commentary for that grade level.
- ☐ Speak to parents at your school's first "open house" of the year, explaining the purpose of *Sunshine Math* and the long-term value of children working independently on the worksheets.
- ☐ Recruit several assisting adults (PTA members, aides, senior citizens, business partners, churches, and so on) who are enthusiastic, dependable people to manage the program. Early in the year, meet with these assisting adults to plan such details as:
    - ✔ A prominent place and format for the STAR CHART.
    - ✔ A designated time each Monday and Friday for the assisting adult to be in the school to receive and distribute papers from students, and post stars.
    - ✔ A system for the activity sheets to be duplicated each week.
    - ✔ A plan for extra incentives for accumulating stars. ("World records" to be kept from year-to-year; a celebration day planned for the end of school; students earning prizes for attaining certain levels of success -- see the reverse side of this page for examples.)
    - ✔ A schedule for when the program will begin, and whether or not there should be a "start over" point at some time in the school year. Review a school calendar, and use only weeks that have at least four school days in them. If there isn't time in the school year to cover all the activity sheets under these conditions, decide which sheets to eliminate or when to "double up."
    - ✔ If possible provide volunteers with a *Sunshine Math* cap, name tag, tee-shirt, or other identifying feature.
- ☐ Monitor the program every two weeks to clear up any unforeseen problems. Administrators need to be highly visible for *Sunshine Math* to succeed.

Sunshine Math is an optional program for students. It should be available to any student who wants to participate, regardless of prior success in mathematics. A large number of students will usually begin the program, but a majority of them will lose interest. However, a significant number of students will continue their interest over the life of the program. This is normal and simply means that *Sunshine Math* is successfully addressing the needs of the self-directed learner.

Visual reminders help children see that mathematics is challenging and rewarding. Some ideas are presented below, merely to start your creative juices flowing:

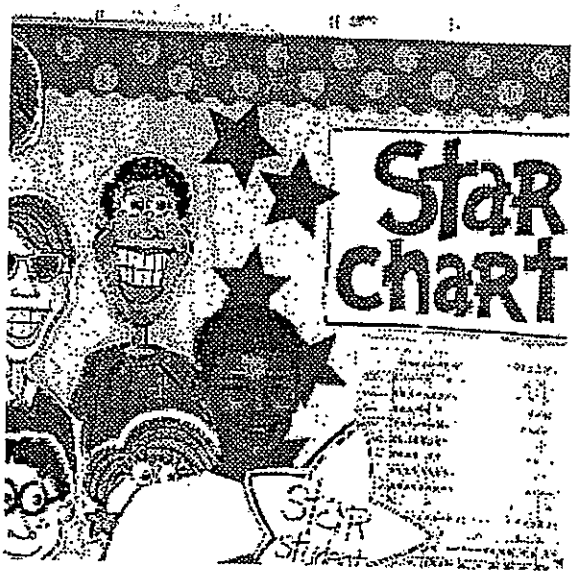


Climb the Mountain this Year!!!

Join the Sunshine Math Club

Sunshine Math: Information for Assisting Adults

Sunshine Math is designed to give assisting adults a well-defined role to play in the school's mathematics program. The success of *Sunshine Math* depends on a team effort among teachers, administrators, parents, and you. Reliability and punctuality are important -- students will rapidly come to depend upon you to be there as scheduled, to check their papers and post their stars, and to listen to alternate ways in which they may have interpreted a problem to arrive at a unique answer. If possible, wear an outfit that fits with the *Sunshine Math* logo; students will quickly begin to identify you as an important person in their school.



Sunshine Math works on a weekly cycle. Each Monday, you collect the worksheets from the previous week and distribute new worksheets to the participating students, all from your *Sunshine Math* area of the school. Allow students to see the answers to the problems, and discuss any for which they arrived at a different answer, giving them credit if their interpretation and reasoning are sound. You then check the worksheets from the previous week, and post the stars earned on the STAR CHART.

Participating students have from Monday until Friday to work the problems entirely on their own -- the only help they can receive during that time is for someone to read the problems to them. On Friday, the teacher hosts a problem-solving session in the classroom, having students describe their approaches to the more difficult problems. Students who have already worked the problems discussed, prior to the problem-solving session, can earn double stars -- you can identify these by looking for the teacher's initials beside certain problems. The students will have the weekend to complete any problems they want to -- for successfully completing these problems, they earn the indicated number of stars.

Be creative when designing a star chart. The basic method of posting stars individually is a good way to begin, but eventually you will want a color-coded system, or perhaps posting only one star each week, with a number in its center. Personalize the chart and the entire *Sunshine Math* center with pictures of students, "smiling faces," and so on. Occasionally bring in a reward for each child -- perhaps a cookie or a hand stamp in the shape of a star -- just for turning in their worksheet. Be creative and enjoy your role -- you are helping enthusiastic students develop higher-level thinking skills!

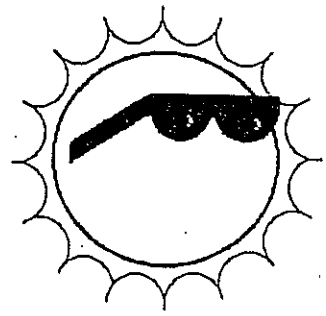
Checklist for assisting adults:

- ❑ Plan with the principal the following:
  - ✔ A prominent place and format for the STAR CHART.
  - ✔ The time and place for you to take up and check papers, and distribute new worksheets.
  - ✔ The system for duplicating worksheets each week, ensuring legible copies.
  - ✔ Any extra incentives ("world records," stickers, coupons, pencils, tee shirts, etc.) that will be part of the system for rewarding levels of achievement in *Sunshine Math.*
- ❑ Make the *Sunshine Math* center a happy place. Use bright colors, smiles, and cheerful words. Show confidence, friendliness, and encouragement to students.
- ❑ Collect the letters which are sent home prior to the first worksheet and signed by each student and parent. If in the future you have evidence that the work turned in does not represent the thinking of the student, discuss the situation with the classroom teacher. These situations are best handled individually in a firm, consistent manner.
- ❑ Check the worksheets from the previous week consistently. If you give partial credit for a problem with several parts, do so in a fair way that can be explained to students. Do not award partial credit for problems with only one answer.
- ❑ Have answer sheets available and encourage students to look at the answers when they hand in their worksheets. Allow them to explain their thinking if they arrived at a different answer. Award them full credit if they show a unique interpretation of the problem, and logical reasoning in obtaining an answer.
- ❑ Leave extra worksheets with the classroom teacher for participating students who were absent on Monday. Accept a late-arriving worksheet only if the student was absent on Monday. If a students' name is missing, or on the wrong place on a worksheet, check the paper but award the stars to "no name" on the STAR CHART. Adhering strictly to these rules will rapidly teach responsibility to the students, and keep your work load manageable.
- ❑ Keep all returned worksheets. As the same worksheets are used year-after-year, and many participating students have siblings who will later be in *Sunshine Math*, it is important that the students not be allowed to keep their worksheets.
- ❑ On weeks when *Sunshine Math* will not be available, post a sign such as "No star problems this week, but please come back after the vacation for more!"

Sunshine Math: Information for Teachers

Sunshine Math is a program designed to complement your regular classroom mathematics curriculum. It offers a peripheral opportunity for students to practice mathematics skills appropriate for their grade level and, at the same time, to participate in problem-solving experiences. It offers a challenge to those students who are self-directed learners by giving them something worthwhile to do outside of class.

Your involvement is strictly as a teacher. *Sunshine Math* will remain special to students if it's managed by someone outside the classroom, and if the teacher is viewed as a facilitator in the system, rather than as the authority figure. Your primary role is to monitor the system in your own classroom and host a brief problem-solving session for *Sunshine Math* students on Friday of each week. You will also need to release the participating students from your class at a set time on Monday to turn in their worksheet and obtain a new one. You might make yourself a special pin like that shown to the right, to wear on Monday and Friday to remind students that those days are special.



Each student worksheet has an accompanying commentary page. This sheet provides hints on parallel problems which you might use in the Friday problem-solving session. It is important that students participate actively in this session, and that you solicit from them their unique approaches to the problem discussed. Only after students present their ideas should you provide guidance on the problems, and then only when necessary. Even though there is a comment provided for each problem, you will have to decide which 3 or 4 problems you will cover during this brief session. Concentrate on those whose solution requires a strategy. The problem-solving session should last no more than 15 minutes.

Do not be disappointed if a large number of your students begin *Sunshine Math*, but many drop out after a few weeks. This is normal; problem solving requires a great deal of effort, and only certain students are ready for this challenge. On the other hand, you will also note that certain students *do* chose to stay in *Sunshine Math* week after week, even though they aren't as successful as other students at earning stars. Their participation should be encouraged, as they are certainly learning from the experience. Under no circumstances should *Sunshine Math* be reserved for only the advanced students in your class.

As a purely practical consideration, students are not allowed to discuss the problems with other students or their parents prior to the Friday "cooperative group" problem-solving session. This allows the "think time" necessary for students to develop into independent thinkers; it also prevents students from earning stars for work that is basically someone else's, which is the surest way to disrupt the entire *Sunshine Math* program. As the teacher, you must monitor this in your classroom and ensure that students abide by the established rule.

It is important that you understand and support the overall philosophy of *Sunshine Math.* Do not worry if students encounter problems for which they have not been prepared in class -- such is the nature of true problem solving. Do not provide remedial instruction to ensure that students master certain types of problems -- they will meet these same problem types repeatedly in the program, and likely will learn them on their own and from listening to other students at the problem-solving session. You should enjoy what the students *can* do, and not worry about what they can't do. You should also read over the general information about the program, to see how your role fits into the entire system.

Here are some hints that you might find useful in your support role for Sunshine Math:

- ✔ Allow your students to leave the classroom at the designated time on Monday to turn in their worksheets and pick up a new one.

- ✔ Read each week's worksheet yourself, and feel free to structure classroom activities that parallel those on the *Sunshine Math* worksheet.

- ✔ During the school week, students should be allowed to work on their *Sunshine Math* problems during their spare time, but the only help they can receive is for someone to read the problems to them. Give the students one warning if you observe them discussing the worksheets, and take away their papers for the next violation. If it happens another time, dismiss them from *Sunshine Math* for a month.

- ✔ At the problem-solving session on Friday, remember these points:

  - ➞ Students come to this session with their worksheets, but without pencils.

  - ➞ The session must be brief -- 15 minutes at most. Discuss only the 3 or 4 most difficult problems on the worksheet.

  - ➞ Help students summarize their own approaches to the problems, in a non-judgmental fashion. Offer your own approach last, and only when it's different from the student strategies. Do not allow answers to be given to the problems.

  - ➞ End the session by encouraging students to complete the problems over the weekend. Put your initials beside any problem discussed in class which a student has already completed successfully. The assisting adult will award double stars for these.

- ✔ Remember that part of the *Sunshine Math* philosophy is that students learn responsibility by following the rules of the system, if participation is important to them. *Sunshine Math* becomes very important to certain students, so they will adhere to rules about where their names goes on each paper, no credit if they forget their paper on Monday, no talking about the problems prior to the problem-solving session, etc., if *you* enforce the rules.

- ✔ Enjoy *Sunshine Math*. Students will impress you with their ability to think, and their creative ways to solve problems that appear to be above their level.

Here's a song for your students -- to the tune of "When you wish upon a star":

When you get your SUPERSTARS .....
It won't matter who you are ....
Try a few ....
See what you can do ....
.... and ....
Success will come to you!!!

Sandy Parker, Lake Weir Middle School, Ocala, FL

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

WELCOME TO *SUNSHINE MATH!* We are happy that you want to try some new and different kinds of math problems! As you read the *SUNSHINE* problems, you may find yourself *? PUZZLED?*. Your teacher will be helping you each week with some of the hardest problems. Also, your parents may read the problems to you and offer hints for solving them.

If you would like to begin earnings ***STARS** for solving math problems, sign your name below.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

(Your name)_____I am ready to begin the *SUNSHINE MATH* Program. I promise to do my own thinking on each problem.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

Dear Parents,

We welcome your child and you to *SUNSHINE MATH,* a program designed to enhance your child's journey through mathematics. By expressing an interest in more challenging problem solving, your child has taken the first step toward becoming an independent learner who is able to address many types of problems.

Your child will receive a worksheet each Monday which will be discussed on Friday and collected the following Monday. Each problem is ranked according to its level of difficulty. The more stars you see beside a problem, the higher the level of difficulty, and the more stars your child can earn for solving it.

Each Friday, your child will attend a "help session" to discuss the most challenging problems of the week. Any problem solved prior to the help session will be given double stars, or double credit. After the session, your child may rework problems before the sheets are collected on Monday.

Your role in *SUNSHINE MATH* is to encourage and facilitate problem solving. During the week, allow time for your child to think about each problem. You may need to read the problem to your child, explaining any new words encountered. Feel free to suggest a strategy for solving the problem, offer "counters" or manipulatives, or listen as your child shares her or his thinking, but please **DO NOT GIVE THE ANSWERS.** In order for this program to be effective, the thinking must be done by the students.

It is normal for a child NOT to be able to complete every problem on a worksheet. The process of reading, understanding and approaching the problems is a valuable step in solving many types of problems. Remind your child that she or he is not expected to know the answers to every problem.

Thank you for allowing your child the chance to embark on this mathematical adventure. Your signature gives permission for your child to begin.

_____

(parent's signature)

WORKSHEETS

SUNSHINE MATH - 8
Pluto, I

Name: _____

(This shows my own thinking.)

★ 1. Remove the dime from the center position without touching it. Describe how to do it.

Answer:_____

★★ 2. There are six digits in a sequence -- two 4's, two 5's, and two 6's. There is one digit between the two 4's; there are two digits between the two 5's; and there are three digits between the two 6's. Write this sequence of numbers.

Answer:_____

★★★ 3. While at the park, I saw boys and dogs. Counting heads, I got 32. Counting legs, I got 104. How many boys and dogs were there?

Answer: ____ boys and ____ dogs

★ 4. Each one of a group of students bought one item at a flea market. All of the items sold for the same price. There was no tax. The total paid by the students was $2.03. If each item cost more than $.10, how many students were in the group.

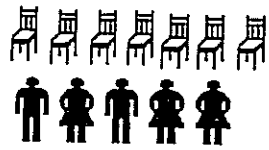
Answer: _____ students

★★ 5. Mr. Barnes is a lumberjack. Using his power saw, he can cut a log into 5 pieces in 6 minutes. How long would it take him to cut the log into 7 pieces?

Answer:_____minutes

★★★★ 6. Five people are going to be seated in a row of seven chairs. How many different ways can they be seated?

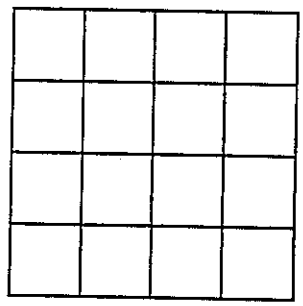
Answer: _____ ways



★ 7. Add one line to make this statement true: $1 + 1 + 1 = 110$

★★★ 8. Put the following numbers into the grid so that no single digit appears more than once in any row, column, or main diagonal.

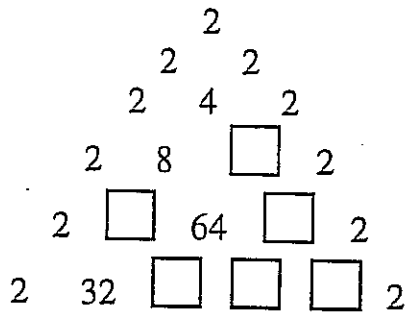
10, 12, 13, 21, 34, 38, 40, 47, 50, 53, 57, 64, 65, 78, 89, 98



★★★ 9. Fill in the missing number:

2, 8, 27, 85, 260, _____, 2365

★★★★ 10. The numbers in the triangle follow a certain pattern. Figure out the pattern and calculate the numbers that would replace the boxes. Write them inside each box.

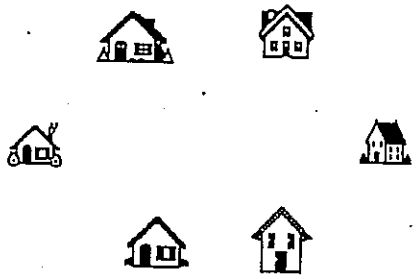


SUNSHINE MATH - 8
Pluto, II

Name: _____

(This shows my own thinking.)

★★ 1. A sidewalk was built to connect each house below to every other house. How many sidewalks were built?



Answer:_____sidewalks

★ 2. These numbers reflect the variation from normal depth of the water level of Lake Okeechobee for five Mondays. Find the average of these five depths.

19.53 8.72 31.27 –2.71 –22.13

Answer:_____

★★★ 3. On a purchase of a pair of athletic shoes, you are offered a 15% discount and a 10% discount to be taken in either order. Which do you ask for first to get the lowest price?

Answer:_____

★★ 4. A basketball player is $6\frac{3}{4}$ feet tall. How tall is he in inches?

Answer: _____ inches tall

★ 5. I want to buy a pair of jeans that cost about $32.00, shoes that cost about $39.00, and a vest that costs about $16.00. On top of that, there is a 6% tax. To the nearest $20 bill, how much money should I bring?

Answer: _____

★★★★ 6. If I take 9 hours to complete a project and you can complete it in $4\frac{1}{2}$ hours, how long would it take us to complete the project together?

Answer:_____hours

★ 7. If January 1st is on a Friday, what day of the week is February 23rd of that same year?

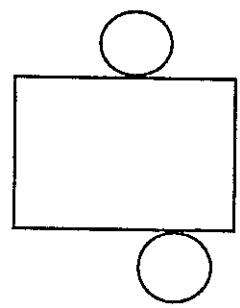
Answer:_____

★★★★ 8. Before the age of technology, the library was overflowing with books. Then during one decade, each book was stored on microfiche. This new storage space was equal to the cube root of the old space. In the next decade, the microfiche were converted to diskettes. This new storage space was equal to the square root of the previous space. Finally, in this decade, each tape has been changed over to a compact disc. The current space is 23 percent of the previous space. If the current space is equal to 3 books, how many books were in the old library?

Answer:_____books

★★ 9. What geometric solid is this, when the shape is cut out and the lines become the edges of the 3-dimensional shape?

Answer: It's a _____.



★★★ 10. A lizard is at the bottom of a well 27 meters deep. He climbs 5 meters every day, but falls back 3 meters every night. How many days does he take to reach the top?

Answer:_____days

SUNSHINE MATH - 8
Pluto, III

Name: _____

(This shows my own thinking.)

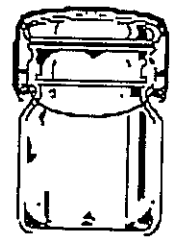
★★ 1. If $A \Delta B = A^2 + 2AB + B^2$, evaluate $4 \Delta 5$.

Answer: _____

★ 2. Express $2.\overline{7}$ as a common fraction.

Answer: _____

★★ 3. In a factory, a machine can fill 180 jars in 15 minutes. How many jars can be filled in 100 minutes?



Answer: _____ jars

★★ 4. What is the mode of this list of 16 numbers? Answer: _____

2 4 7 8 2 10 7 2 5 3 6 8 5 1 0 1

★ 5. If I dig a hole 4 meters square and 2 meters deep, how much dirt is in the hole?

Answer: _____ cubic meters

★★ 6. Sherry was playing a card game with her friends. She needed to draw a diamond greater than 10 to win the game. If she draws from a full standard deck of cards, what is the probability of her winning?

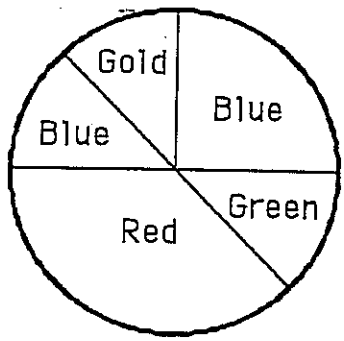
Answer: _____

★★★ 7. Replace R, M, and S with numerals to make a true equation.

$$\begin{array}{r} R\ R\ M \\ +\quad S\ M \\ \hline S\ M\ M\ M \end{array}$$

Answer: R = ___, M = ___, S = ___

★★★★ 8. Study the dart board below. Find the probability of hitting each color when a dart is thrown. Write the answer as a fraction in lowest terms.

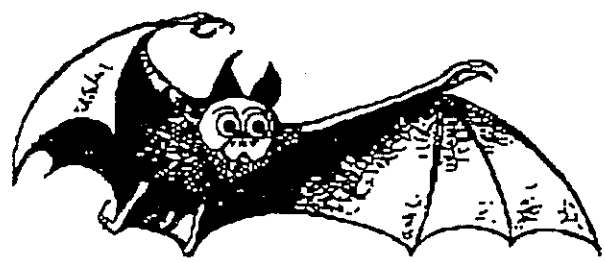


Answer:
Gold _____
Green _____
Red _____
Blue _____
Blue or Gold _____
Orange _____

★★★★ 9. There are fewer than 6 *dozen* Blow Pops in my bag. If I count them by 2's, there is 1 left over. If I count them by 3's, there are 2 left over. There are 3 left over if I count by 4's. Four are left if I count by 5's. How many Blow Pops are in my bag?

Answer:_____blow pops

★★★ 10. A bat ate 208 bugs in 4 days. Each day she ate 20 more than the previous day. How many bugs did she eat each day ?



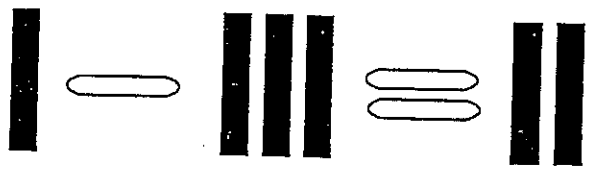
Answer: day 1: ____bugs; day 2: _____bugs; day 3: ____bugs; day 4: _____bugs

SUNSHINE MATH - 8
Pluto, IV

Name: _____

(This shows my own thinking.)

★ 1. Move one of the three popsicle sticks to make a true equation. Use arrows to show which one you move and how you move it.



★★★★ 2. You can make up for being late to Mr. Reeves' class if you are well prepared upon arriving. His formula for how many minutes of detention you must serve is $m = 30 - 5x$. This formula allows 5 minutes off the 30-minute punishment for each question you answer correctly in class.

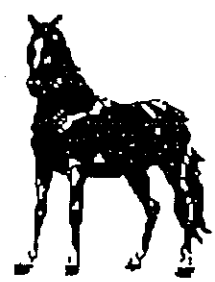
a. What does x stand for in the formula? _____

b. What does m stand for in the formula? _____

c. If you are tardy but answer 2 questions correctly in class, how long is your detention? _____ minutes

d. If you are tardy, how many questions must you answer in class so that you have no detention to serve? ____ questions

★★★ 3. Farmer Henson needs to fence in a small area to make a horse pen. The pen needs to be about 900 ft^2 in area for the horse to be comfortable for a short time. To the nearest foot, how much fencing will he need if the pen is circular in shape? Use 3.14 for π.



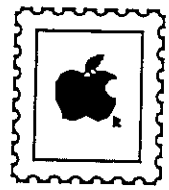
Answer: _____ feet of fencing

★★★★ 4. A diver is working 10 feet below the surface of the water. The gap between the water and the deck of his support barge is $\frac{1}{8}$ of the total length of air hose, and $\frac{2}{3}$ of the total length remains on the reel. What is his maximum working depth without a change of equipment?

Answer: _____ feet

★ 5. There are twelve \$0.29 stamps in a dozen stamps. How many \$0.32 stamps are in a dozen?

Answer: _____ stamps



★ 6. At a pharmacy, Mrs. Dull paid \$2.35 for a toothbrush, \$ 1.30 for a comb and \$4.99 for shampoo. The sales tax is 6%. Find the change she should receive from a ten-dollar bill.

Answer: _____

★★★ 7. Georgia solved a problem in her math homework that gave her an answer of $0.\overline{425}$ but the problem asks for the answer to be a common fraction. What would that fraction be?

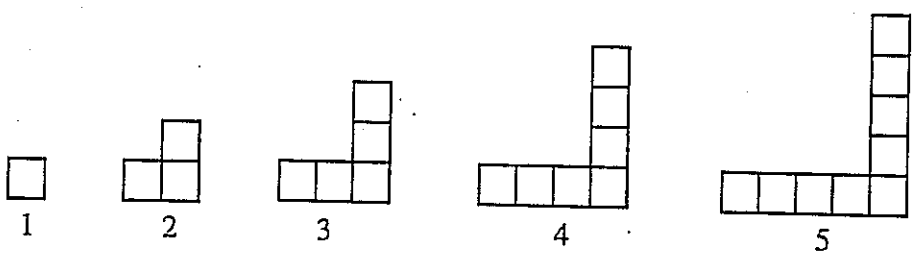
Answer: _____

★★ 8. How much larger is 3^4 than 4^3?

Answer: _____

★★★★ 9. Study the relationship between the figure number, its *area*, and its *perimeter*. Then answer the questions below the figures.

Figure Number	1	2	3	4	5	6 33
area	1	3	5	7	9	11 65
perimeter	4	8	12	16	20	24 132



a. What is the area for figure 100? _____ What is its perimeter? _____

b. What is an algebraic expression for the area of figure number n? _____

c. What is an algebraic expression for the perimeter of figure number n? _____

SUNSHINE MATH - 8
Pluto, V

Name: _____

(This shows my own thinking.)

★★ 1. Show how to make a sum of exactly 100 by using only 15, 21, 24, 27, or 31. Any or all may be used more than once.

Answer: _____

★★ 2. Replace A, B, and C with numbers so that:

A x A = B
B - A = C
A + A = C

Answer: ___ x ___ = ___
___ - ___ = ___
___ + ___ = ___

★★★ 3. From the manufacturer, we know the ratio of yellow M&M's to orange M&M's made is 4 to 7. If 56 orange M&M's are in a large package, about how many yellow M&M's would be in the package?

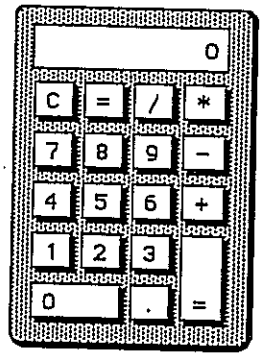
Answer: _____yellow M&M's

★★ 4. Use a calculator to find the answer to:

(13450 + 0.36) - (6 x 2141.06).

Then turn the calculator upside down to find an animal.

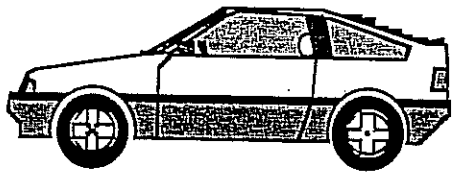
Answer: The animal is a _____.



★★★ 5. If $x + y = 12$ and $x - y = 8$, find the product of x and y.

Answer: _____

★★ 6. Lori and Tim bought a new car at an "end of the year closeout sale" for "dealer cost plus 8%." If they paid $18,036, what was the dealer's cost?



Answer: $_____

★★★ 7. Jason worked 6 days. The first day he was paid $200. Each day thereafter he was paid $\frac{1}{2}$ of what he made the day before. What was his total wage ?

Answer: $_____

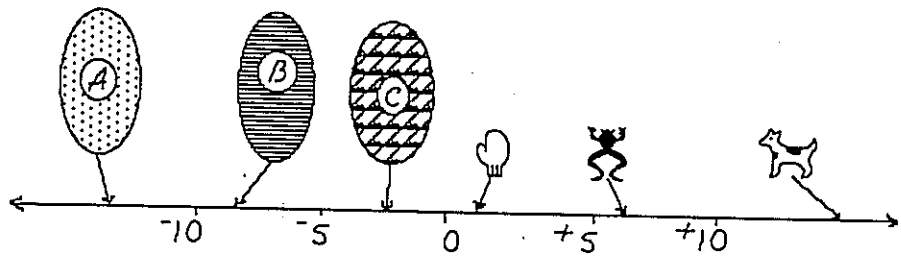
★★ 8. How many diagonals are in a regular decagon?

Answer: _____diagonals

★ 9. What common word can be spelled out by the letters on a compass?

Answer: _____

★★★ 10. Approximately what number is represented by each object below:



Answer: A is ___; B is ___; C is ___; mitt is ___; frog is ___; dog is ___

SUNSHINE MATH - 8
Pluto, VI

Name: _____

(This shows my own thinking.)

★★★★ 1. On a digital clock showing hours and minutes, how many different readings between 11:00 a.m. and 5:00 p.m. contain at least two 2's?

Answer: _____

★ 2. A clever woman sat beneath a grape vine watching her husband pick grapes. She noticed that the number of grapes in his basket doubled every minute, and that it was precisely filled at 1:00 p.m. At what time was his basket half full?

Answer: _____

★★★★ 3. Bev, Debbie and Jen are friends. Debbie, who always tells the truth, says the youngest woman is her cousin. Bev, who always lies, says she is older than Debbie but younger than Jen. The ages of the women are 40, 36, and 23. Give each woman's age.

Answer: Bev _____ Debbie _____ Jen _____

★★★ 4. The faces on a regular decahedral die -- one with ten faces instead of six -- are numbered one through ten. What is the probability of rolling three 8's in succession?

Answer: _____

★★★ 5. If $a \diamond b = \frac{1}{b} - \frac{1}{a}$, express $8 \diamond 3$ as a common fraction.

Answer: _____

★★ 6. Farmer Benson has a rectangular pig pen. The lengths of the pen's sides are 26 m by 18 m. If the length of each side of the pig pen is tripled, what will happen to the area of the pig pen? Circle the best answer below.

a. The area will also triple.
b. The area will be 9 times as much as before.
c. The area won't change.
d. The area will double.

★ 7. Stamps are $0.32. Janice has $7.00. How many stamps can she buy?

Answer: _____ stamps

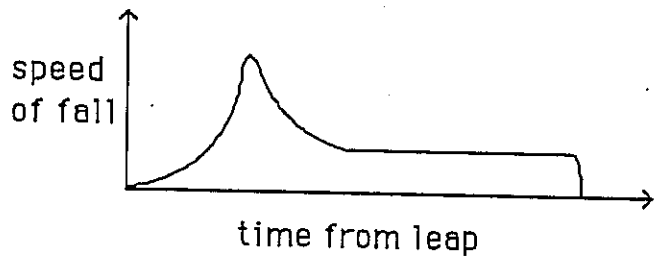
★★ 8. For every 5 serves Gabrielle makes, Tammy makes 3. At practice one day, Tammy made 75 serves. How many serves did Gabrielle make?

Answer: _____ serves

★★★★ 9. Ginger watched the man from the carnival ride a very tall bicycle. She wondered about riding it from Mudville to Peoria, a distance of 266 miles. The diameter of the wheels was 83 inches. The pedals were geared so that one complete turn caused the wheel to rotate 8.4 times. If Ginger turns the pedals once every 5 seconds, and can maintain that rate, about how long would it take to make the trip?

Answer: _____ hours

★★★ 10. The story of a skydiver has been jumbled up. Place each letter on a correct position on the horizontal axis of the graph, to show when that event was occuring.



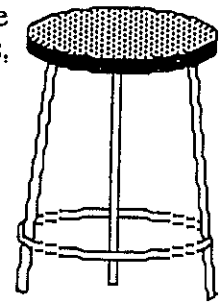
A. She opened the parachute.
B. She hit the ground.
C. She leaped from the plane.
D. She floated gently down.
E. She was in "free fall" after jumping.

SUNSHINE MATH - 8
Pluto, VII

Name: _____

(This shows my own thinking.)

★★★ 1. Mrs. Graham's science laboratory has some stools with 3 legs and some chairs with 4 legs. If there is a total of 158 legs on the stools and chairs, and 42 total seats in the room, how many stools and chairs are in Mrs. Graham's science lab?



Answer: _____ stools and _____ chairs

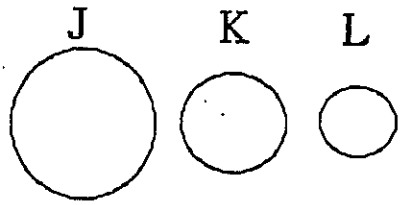
★★ 2. Sheila's volleyball team has lost 11 games. The team has won 5 more than they have lost. What is their winning percentage?

Answer: _____ percent

★★ 3. Julio was driving from his home to Tampa. The last road sign he saw said it was 177 miles to Tampa. Julio has driven 51 miles since he saw the last road sign. He is now half way to Tampa. How far is it from Julio's home to Tampa?

Answer: _____ miles

★★ 4. J, K, and L are circles. Circle J has a 32 inch diameter. The radius of circle J equals the diameter of circle K. The radius of circle K equals the diameter of circle L. How long is the radius of circle L?



Answer: _____ inches

★★★ 5. Molly collects baseball cards. For every card that has a pitcher on it, 12 do not. If Molly has a total of 403 baseball cards, how many of them are of players that are not pitchers?

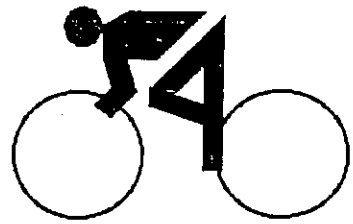
Answer: _____ cards

★ 6. There are 9 rows of student desks in Elizabeth's math class. Each row has the same number of desks. If 15 students just fit into the first 3 rows with no empty seats, how many student desks are there in Elizabeth's math class ?

Answer: _____desks

★★★★ 7. Jack wanted to win the big bicycle race, so he trained hard for a week -- 7 days. Each day he rode 3 miles farther than he had the day before. If he rode a total of 126 miles, how far did he ride on the last day of the week?

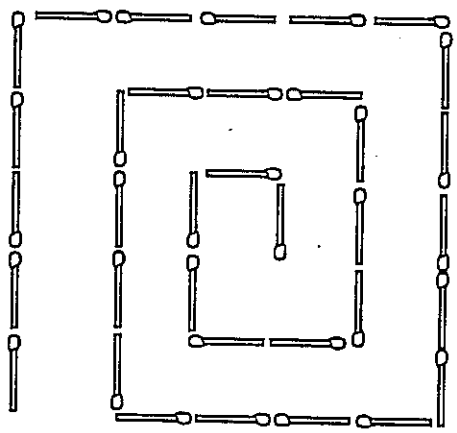
Answer: _____ miles



★★★ 8. Sue usually makes 6 free throws out of 10 trys. What is the probability she will make her next two free throws?

Answer: _____

★★★ 9. Thirty five matchsticks are placed so that they make a spiral that goes counterclockwise. Show how to shift four matchsticks to make the spiral go clockwise. Draw arrows to show how the four matches are moved.



SUNSHINE MATH - 8
Pluto, VIII

Name: _____

(This shows my own thinking.)

★★★ 1. The faces on a regular die are numbered 1 through 6. What is the probability of rolling three four's in succession? Give your answer as a common fraction.

Answer: _____

★★ 2. Two girls each had a different number of bracelets. Joyce said, " If you give me 8, I'll have as many as you." Leslie replied, " If you give me 8, I'll have twice as many as you." How many did each have?

Answer: Joyce has_____ bracelets.

Leslie has_____ bracelets.

★★ 3. How many different 3-digit numbers can you write using the numbers shown below only one time?

2 4 7 9

Answer: _____ numbers

★★★ 4. Karch gave $\frac{1}{2}$ of his stamp collection to AJ. Then he gave $\frac{3}{4}$ of the remaining stamps to Ricci. If he ended up with 12 stamps, how many did he have when he started?

Answer: _____ stamps

★★★★ 5. The Hi-N-Dry Volleyball Company has exclusive rights to make a waterproof volleyball for games at the beach. The company controls the shipment of its balls with a special code. Last week's shipment consisted of 20 cartons -- the first five cartons are numbered in this way: 04343, 08686, 13029, 17372, and 21715. The last 2 cartons shipped were 82517 and 86860. The company is in a panic because every carton that began and ended with an even digit has been lost. How many cartons have been lost and what are the carton numbers?

Answer: a. _____ cartons were lost.

b. The lost numbers were: _____

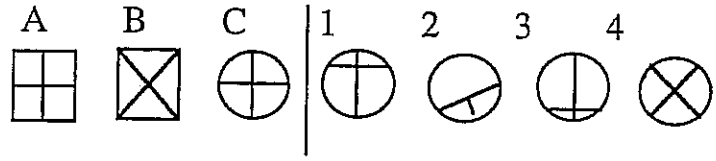
★ 6. You have yarn that is 8 yards long. If it takes you 1 second to make each cut, how long will it take you to cut the yarn into 1 foot pieces ?

Answer : _____ seconds

★ 7. The results from a recent survey show that the the most popular magazines among men are *Sports Illustrated*, *GQ*, and *Consumer Reports*. Of the men surveyed, 13 subscribe to *GQ* only, 28 to *Sports Illustrated* only, and 19 to *Consumer Reports* only. The survey shows that, of the men who take two magazines only, 17 take both *GQ* and *Sports Illustrated*, 21 take both *Sports Illustrated* and *Consumer Reports*, and 13 take both *GQ* and *Consumer Reports*. Fourteen men subscribe to all 3 magazines. How many men were surveyed?

Answer: _____men

★ 8. Figure A changes to B as C changes to:



Answer: _____

★★ 9. Mentally find the product of 2 x 48 x 50. When you turn in your paper, you will have a problem like this to do in your head.

Answer to later problem: _____

★★★ 10. Find the area of a soccer field outside the center circle if the field is 100 m by 50 m and the diameter of the center circle is 15 m.

Answer: _____ m^2

★★ 11. Write an equation for this situation, using *h* for the cost of 1 hot dog. Solve the equation.

An 8-pack of hot dogs and a jar of mayonnaise costs $2.42. The mayonnaise is $1.30. What is the cost of each hot dog?

Answer: An equation is: _____. The solution is: $h =$ _____

SUNSHINE MATH - 8
Pluto, IX

Name: _____

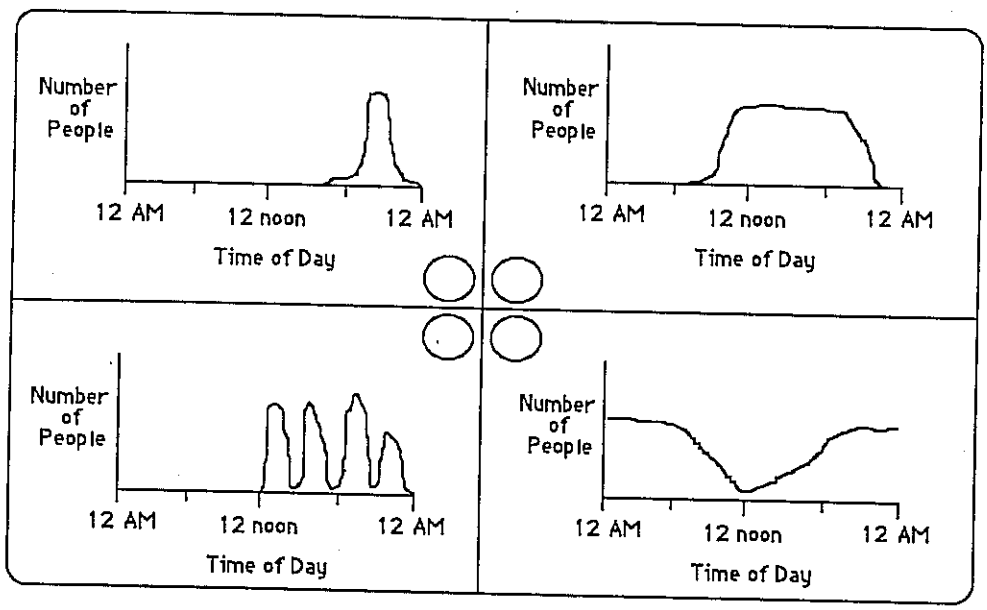
(This shows my own thinking.)

★ 1. What is the smallest number of Blow Pops, and of which color, would you have to add to a bowl full of pops containing 8 cherry and 8 sour apple so that the ratio of cherry to sour apple changes to 1 to 2?

Answer: _____

★★★★ 2. Use number sense to match each graph with the number of people at each location. Put the letter of each location in one of the four center circles.

Locations:
A. motel B. football stadium C. movie theater D. shopping mall



★★★ 3. Your Aunt Ada sent you a $25 gift certificate for Camelot Music. You spot 2 C.D.'s you would like to have. One costs $16.90 and the other is on special for $13.10. What percent of the total cost will you have to pay with your own money?

Answer: _____%

★★★ 4. The Easter Bunny Academy just graduated 10 new Bunnies, complete with costumes, to work the local malls. As they prepare to leave for their duties at the mall, each bunny shakes hands with each of the other bunnies. How many handshakes will there be?

Answer: _____ handshakes

★★★ 5. Finish these number patterns out to the tenth position, and find the sum:

a. $^{-}1 - {}^{-}2 - 3 - {}^{-}4 - 5 - {}^{-}6 - \ldots - {}^{-}10 =$ _____

b. $- {}^{-}100 + {}^{-}90 - {}^{-}80 + {}^{-}70 - {}^{-}60 + \ldots - {}^{-}10 =$ _____

c. $2 - {}^{-}4 + 6 - {}^{-}8 + 10 - {}^{-}12 + \ldots - {}^{-}20 =$ _____

★ 6. Given $m = 43$ and $n = 27$, evaluate $15m + 12n - 2m$.

Answer: _____

★★★ 7. While building a medieval castle it cost Sir Bedemere 36 guilders to hire 5 artists and 3 stone masons, or 28 guilders for 3 artists and 5 stone masons. What is the cost of each one?

Answer: An artist costs _____

A mason costs _____

★★★ 8. Kent needed to purchase a new step ladder. The ladder he wanted cost $42.95 but Kent noticed that it was on sale for 25% off. The sales tax in his county is 6%. What will be the total cost of Kent's ladder?

Answer: $_____

★★ 9. What is the square root of the cube root of 729?

Answer: _____

★★★ 10. On a number line, what is the coordinate of a point $\frac{1}{3}$ the distance from $^{-}5$ to 13.

Answer: _____

SUNSHINE MATH - 8
Pluto, X

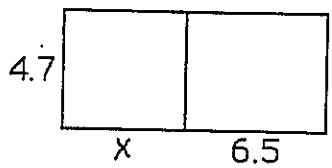
Name: _____

(This shows my own thinking.)

★ 1. June finishes her math homework 90% of the time. If she has homework for each school day for four full school weeks, how many days will she turn in her homework?

Answer: _____ days in four weeks

★★ 2. Write an expression for the area of the rectangle. Evaluate the expression for $x = 10$.



Answer: An expression is: _____

If $x = 10$, the area is: _____

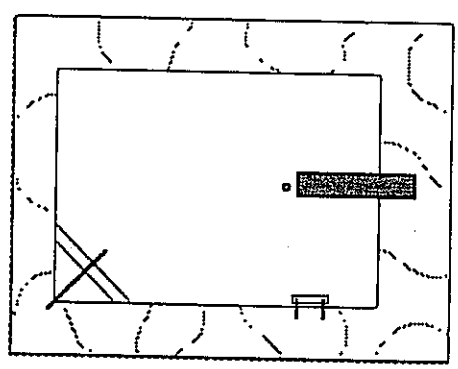
★★★★ 3. Lu works as a waitress from 4:00 until 7:30 some days after school. She gets paid $3.75 an hour plus her tips. Last week Lu worked Monday, Tuesday, and Friday. If she received $18.75 in tips last week, how much did Lu earn for the week total?

Answer: $_____

★★ 4. Katie broke open her piggy bank and found 3 quarters, 3 nickels, some dimes and a lot of pennies. She counted and found she has $3.60 in change. She also found that she has just enough pennies to wrap a $0.50 roll. How many dimes did Katie have in her bank?

Answer: _____ dimes

★★★ 5. David put 155 feet of plastic edging around the outside edge of the concrete surrounding Mrs. Rhum's pool to keep grass out of the water when he mows her yard. The concrete is 17.5 feet wide. How long is the concrete?



Answer: _____ feet long

★★ 6. Jean said there were 1634 students in River Ridge Middle School. Mr. Brown said that there were 72 more girls than boys. How many girls attend River Ridge Middle School?

Answer: _____ girls

★★ 7. With the clock showing 3:30 remaining in the game, Bruno's football team had the ball on their own 35 yard line. In the next 8 plays, they averaged 5 yards a play and 25 seconds per play. On what yard line did they begin the 9th play, and how much time was left?

Answer: _____ yard line with _____ left

★★★ 8. Julie bought some stamps. She paid $6.00 for every 12 stamps she bought. Later, Julie was offered $6.00 for every 8 of them. She sold them all and made a profit of $12. How many stamps did Julie buy and sell?

Answer: _____ stamps bought and sold

★ 9. The Guinness Book of World Records says that a dentist from Rome, Italy kept all the teeth he extracted from 1868 until 1904. They were later counted, and totaled 2,000,744. If they dentist worked every day of the year, about how many teeth did he pull per day, to the nearest ten teeth?

Answer: _____

★★ 10. Maureen is training for a 3-mile race. Her goal is to finish in 18 minutes. On a training run, she looks at her watch and sees that she is passing the 2-mile mark when her elapsed time reads 11 minutes, 45 seconds. Should she slow down, or run faster, to finish at the 18-minute mark?

Answer: She should _____.

SUNSHINE MATH - 8
Pluto, XI

Name: _____

(This shows my own thinking.)

★ 1. Jill, Joe and Tanya each got different grades in math class. None of them earned less than a C. Jill's grade was better than Tanya's. Joe did not do as well as Tanya. What grade did each student receive?

Answer: Jill _____
Joe _____
Tanya ____

★★★★ 2. Jane's aquarium contains goldfish, turtles, and snails. There are 16 legs, 10 shells, and 36 eyes in the aquarium. How many creatures of each type are there in the aquarium? (Hint : Snails have one shell and one leg.)

Answer: ____ goldfish, ____ turtles and ____ snails

★★★ 3. You have boxes that will hold 1 candy bar, 3 candy bars, 9 candy bars, and 27 candy bars. If each box must be packed full, what is the fewest number of boxes you need to hold 377 candy bars?

Answer: ____ boxes

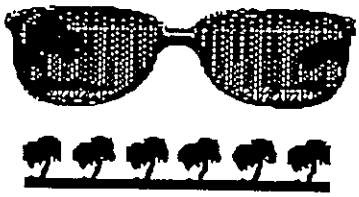
★★ 4. E.J. went to the mall. She picked out some blue jean shorts for $24.59, an Esher T-shirt for $17.50, and some sandals for $11.99. How much tax must she pay for all the items if the sales tax is 6%?

Answer: _____

★ 5. E.J. asks her Mom for the money to pay for the clothes, shoes and the taxes on them. To the nearest $5, how much money should she ask her Mom for to cover all her purchases?

Answer: $_____

★ 6. In Miami, it rained 71 out of the 92 days of the summer. Given this information only, what is the probability that it rained on July 4th?



Answer: _____

★★ 7. The ratio of boys to girls in our math class is 5 to 7. If there are 6 more girls than boys in our class, how many students total are there in our math class?

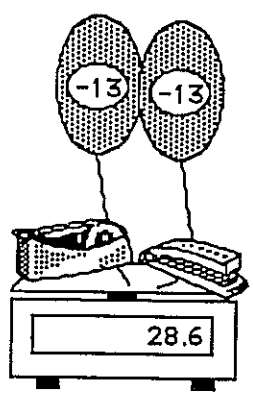
Answer: _____ students

★★★ 8. Richard and Fidel took a trip together. While they traveled, each of them recorded the money he spent for expenses. When they arrived home, they agreed to share the expense equally. Which one owes the other, and how much money does he owe?

Richard spent:	Fidel spent:
Gas $73.42	Tickets $41.76
Room $67.24	Food $102.50

Answer: _____ owes $_____ to _____.

★★ 9. A helium balloon floats *up*, and so has negative weight. Each balloon shown to the right exactly balances 13 grams, and so has weight -13 grams. If the balloons were removed from the scale but the tape dispenser and stapler left on, what would the scale read in grams?



Answer: _____

SUNSHINE MATH - 8
Pluto, XII

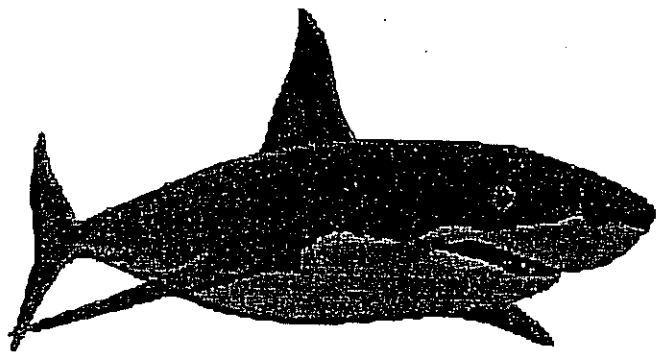
Name: _____

(This shows my own thinking.)

★★ 1. Caitlin's shadow is 10 feet long at the same time that the shadow of a nearby statue is 24 feet. If Caitlin is 5 feet tall, how tall is the statue?

Answer: _____ feet

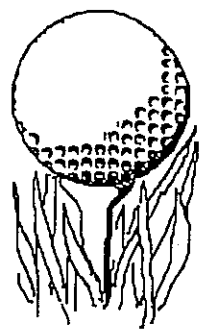
★★★★ 2. The computerized range-finder on the undersea filmmaker's camera told her that a grouper started 60 fin strokes ahead of a bull shark. The bull shark made two strokes to every three made by the grouper; but the shark's stroke covered as much distance as the grouper covered in seven strokes. How many strokes did the shark take before it swallowed the grouper?



Answer: _____ strokes

★★★ 3. If a golf ball weighs 40 grams and half a golf ball, what does a golf ball and a half weigh?

Answer: _____ grams



★ 4. There are 3 pencils, 4 pens, and 2 markers in Jill's purse, all identical to the touch. What is the probability she will pull out a pencil if she reaches in without looking?

Answer: _____

★★★ 5. Craig wants to paint his room royal purple. The length of his room is 15 feet and the width is 10 feet. The walls are 9 feet tall. If one wall has a window that is 3 feet by 2 feet and another has a door that is 3 feet by 8 feet, how many square feet will he be covering with paint?

Answer: _____ square feet

★★ 6. Spike Nashbar is shipping volleyball nets to Italy. The nets are 32 feet wide and 3 feet high. The Italians use the metric system -- how long and how high are the nets in meters? (Hint: 1 in. = 2.54 cm)

Answer: _____ meters wide and _____ meters wide

★★★ 7. To motivate Reba to work her physics problems correctly, her dad said he'd pay her a quarter for each correct answer and fine her a dime for each incorrect answer. If she received $3.80 after doing 25 problems, how many problems did Reba answer correctly?

Answer: _____ answered correctly

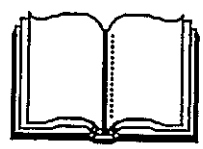
★ 8. A robot arm can attach 300 bolts in 6 minutes. If there are 50 bolts on each item, how many items are completed in an hour?

Answer: _____ items

★★ 9. Consider the last two page numbers of a book.

a. Is their sum an even number, or an odd number? _____

b. Is their product an even number, or an odd number? _____



★ 10. If a doctor prescribed 36 pills and directed you to take them every 4 hours, how many days would they last?

Answer: _____ days

SUNSHINE MATH - 8
Pluto, XIII

Name: _____

(This shows my own thinking.)

★ 1. Pizza Heaven offered to donate pepperoni pizza to give out at the school pep rally. If 1000 students are expected at the pep rally, and each pizza is cut into 8 slices, how many pizzas will Pizza Heaven have to deliver for each student to get 1 piece?

Answer: _____

★ 2. When does four come after five, other than when it's written in numerals like 54 or 574?

Answer: _____

★★★ 3. The new manager for Dillards was hired with a beginning monthly salary x and told she would be given a 10% raise to $3000 a month, within 6 months. What was her beginning salary x?

Answer: $x = \$$_____

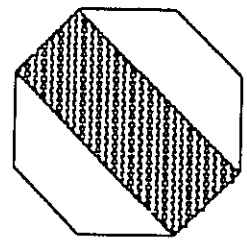
★★★ 4. Warrick and Ricardo are reading the same 230-page mystery novel. Ricardo had a speed-reading course last summer and so reads 5 pages for every 2 that Warrick reads. Warrick has read 28 pages -- how many pages does Ricardo have left to read?

Answer: _____ pages

★★★★ 5. Michael Jordan is flying from Chicago to Nagasaki, Japan. A non-stop flight takes 17 hours and 20 minutes. On this flight, the plane makes a stop in Sacramento for 2 hours and 15 minutes and another in Honolulu for 1 hour and 40 minutes. Michael left Chicago at 3:45 p.m. on Thursday. What day and time did he land in Nagasaki, Chicago time?

Answer: _____

★★★★ 6. A regular octagon is shown to the right. What is the area of the shaded part, as a fraction of the whole octagon?



Answer: _____

★★ 7. Nelson Construction built a drainage ditch that was 800 feet long, 6 feet wide, and $5\frac{1}{2}$ feet deep. If a truck can carry 2000 cubic feet of dirt, about how many truck loads were needed to carry all the dirt away?

Answer: _____ truckloads

★★ 8. Practice doing problems like those below mentally. When you turn in your paper, you will have a chance to do such a problem in your head.

a. $(3 \times 48 + 3 \times 2) + (25 \times 7 \times 4)$

b. $(5 + 25 \times 7) \times (55 + 45)$

c. $[(330 \div 10) \times 3] + (250 \times 2)$

d. $(0.50 \times 12 + 4) + (1 + 18 + 1)$

Answer to the problem when I turn in my paper: _____

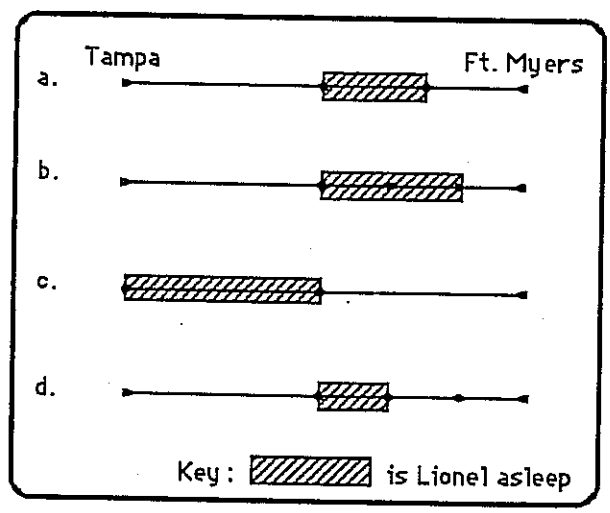
★★ 9. Select the best drawing to illustrate this situation, and find the numerical answer using the drawing.

Lionel fell asleep at the half-way point while riding in a car from Tampa to Ft. Myers. When he awoke, he still had to travel half as far as he traveled while sleeping. If the trip was 200 miles long,for about how many miles was Lionel asleep?

Answer:

The best sketch is _____.

He was asleep about _____ miles.

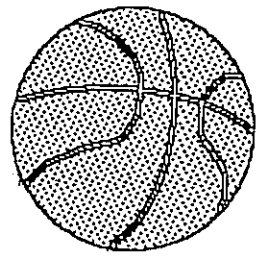


SUNSHINE MATH - 8
Pluto, XIV

Name: _____

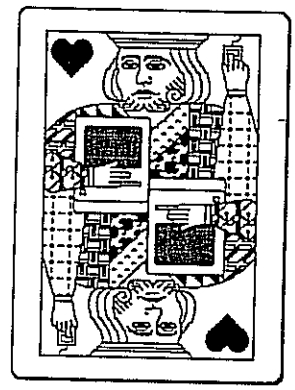
(This shows my own thinking.)

★ 1. You want to make a basketball hoop from a metal bar. You can shape the bar without cutting off any part of it. How long would the bar have to be in order to have a hoop with a 20 inch diameter?



Answer: _____ inches

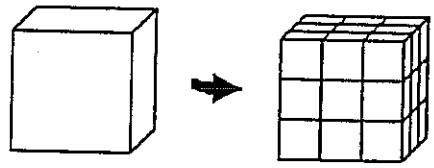
★★★ 2. John is showing his friends a card trick. He first draws a king, does not put it back in the deck, and then draws a second king, supposedly at random. What is the probability of drawing two kings in a row with a regular, well-shuffled deck of cards?



Answer: _____

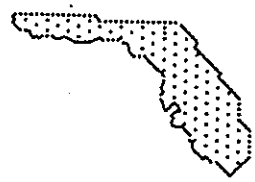
★★★★ 3. A 3-foot cube of Styrofoam is painted purple all over as a prop for a school play. For ease of storage, the big cube is then cut into 27 smaller, 1-foot cubes. How many of the small cubes have paint on exactly 3 faces? On exactly 2 faces? On exactly 1 face? How many of the smaller cubes will be unpainted?

Answer:
___ cubes have 3 faces painted
___ cubes have 2 faces painted
___ cubes have 1 face painted
___ cubes are unpainted



★ 4. The scale on a map of Florida is 1 inch to 40 miles. If the distance between Citrus Springs and Homassassa Springs is $7\frac{1}{2}$ inches on the map, what is the distance in miles?

Answer: _____ miles



★★★★ 5. Mrs. Nielsen is rewarding her math students for all doing well on a test. She passes out 50 pieces of candy, one-by-one, and starts over in the same order after every student gets one piece. Each student takes a piece of candy, in turn, until the plate is empty. Sherwood gets the first piece and he also gets the next-to-last piece. How many students could be in the class for this to be possible, if the minimum class size in the school is 20 students?

Answer: There could be either ___ or ___ students in the class.

★★ 6. A certain number x is greater than 1 but less than 10. When you divide 45, 192, and 353 by x, you get the same remainder. What is the number x?

Answer: $x =$ _____

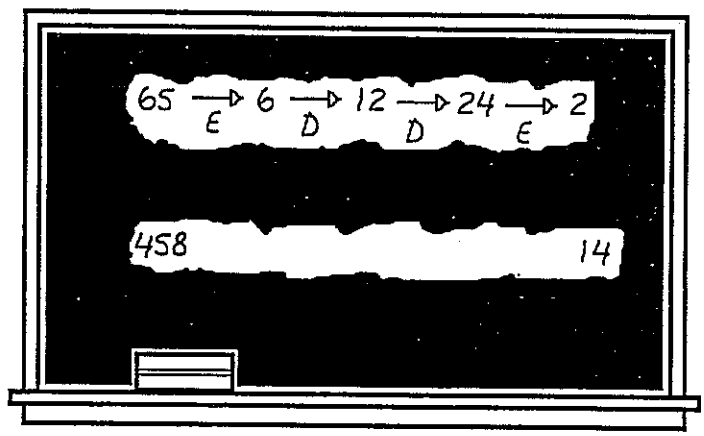
★★ 7. The River Ridge Middle School gymnasium holds 4000 people. The gym was sold out for every home basketball game. If there were 4 times as many single admission tickets sold as season tickets, how many season tickets were sold?

Answer: _____ season tickets

★ 8. Express 53 as the sum of four or less perfect squares.

Answer: _____

★★★ 9. A math game to play when you've got time to spare is to pick any two numbers, and combine the two rules: 1. Erase the last digit, and 2. Double the number, to change one number into the other. The example on the chalkboard shows that E, D, D, and E is one combination that can change 65 into 2. Find a combination of these rules to change 458 into 14.



Answer: One combination is: _____

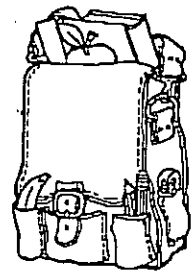
SUNSHINE MATH - 8
Pluto, XV

Name: _____

(This shows my own thinking.)

★★★★ 1. Six bookbags are randomly distributed to the six people who own them. What is the probability that all the people receive the correct bookbag?

Answer: _____



★★ 2. A waitress served $800 worth of dinners at IHOP. She received $95 in tips. How much less, in tips, did she receive than if she had received her expected rate of 15% of the cost of the meals?

Answer: $_____

★★ 3. Jaime wants to know what grade to expect in science. Her chapter test scores for the quarter were 86, 97, 94, 73, and 88.

a. What is Jaime's chapter test average?

Answer: _____

b. If the final exam counts as two chapter tests, what must Jaime make on the final to average 90%, which is an "A" in this course.

Answer: _____

★★★★ 4. The U.S. Census taker stopped by the Busselbaum's home to survey their household. In trying to determine the number of children the Busselbaums have, the census taker received this information:

- *each daughter has the same number of brothers as she has sisters, and*
- *each of the boys has twice as many sisters as brothers.*

How many children do the Busselbaums have?

Answer: _____ children

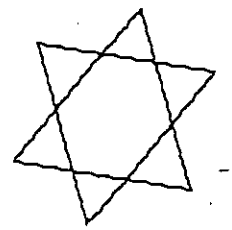
★★ 5. Complete the next two terms in the pattern :

1, 2, 9, 64, 625, _____, _____

★ 6. Evaluate $6a + 5b - \frac{c^2}{3a}$ when $a = 4$, $b = 12$, and $c = 9$.

Answer: _____

★★★★ 7. A six-pointed regular star is formed by two interlocking equilateral triangles. What is the ratio of the area of the entire star to the area of one of the interlocking equilateral triangles?



Answer: _____

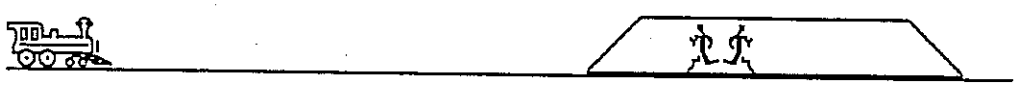
★★★ 8. Mr. Hudson has a box that is 18 cm wide by 36 cm long by 10 cm high. He also has some dice that are 3 cm by 3 cm by 3cm that he wants to store in this box. How many dice can he fit in the box, if he has to put the lid on securely?

Answer: _____ dice

★★★★ 9. Two joggers were crossing a railroad bridge when they suddenly heard the sound of an approaching train. They were smart enough to run for safety -- but each one ran in the opposite direction! Happily, each jogger reached his respective end of the bridge just in time to avoid the train.

If they were 2/5 of the way across the bridge when they heard the train, and the train was going 50 miles per hour, and they both ran at the same speed, how fast did those two guys run?

Answer: _____ miles per hour

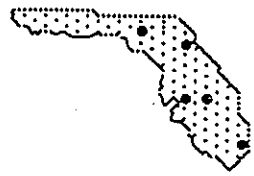


SUNSHINE MATH - 8
Pluto, XVI

Name: _____

(This shows my own thinking.)

★★★★ 1. During her summer vacation, Jenny decided to visit some of her relatives: her cousin, her grandparents, her uncle, her nephew, and her brother, who all live in different cities. The five cities they live in are Orlando, Lake City, St. Augustine, Tampa, and Miami. Jenny used five different types of transportation: car, plane, bus, train, and motorcycle.

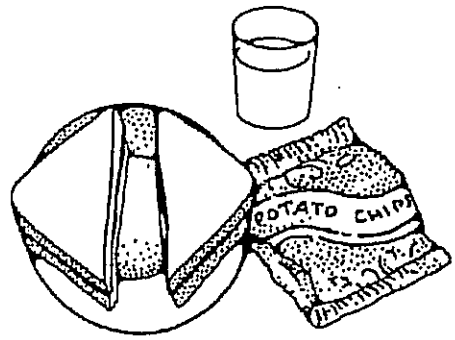


- *She arrived by plane and bus at the two cities which are not on the coast.*
- *Her uncle and her cousin live on the east coast.*
- *Her nephew met her plane when she arrived.*
- *She did not arrive at her uncle's city by car and her uncle does not live in Miami.*
- *She did not go by bus to Orlando or to visit her grandparents.*
- *She did not go to her cousin's city by train.*
- *She arrived at her grandparents by car.*

Who lives where and how did Jenny arrive?

Answer : She arrived by _____ to visit her _____ who lives in _____
She arrived by _____ to visit her _____ who lives in _____
She arrived by _____ to visit her _____ who lives in _____
She arrived by _____ to visit her _____ who lives in _____
She arrived by _____ to visit her _____ who lives in _____

★★ 2. A sandwich costs $1.12, the chips cost half of what the sandwich cost, and the milk costs one quarter of the price of the sandwich. How much does the whole meal cost?



Answer : $ _____

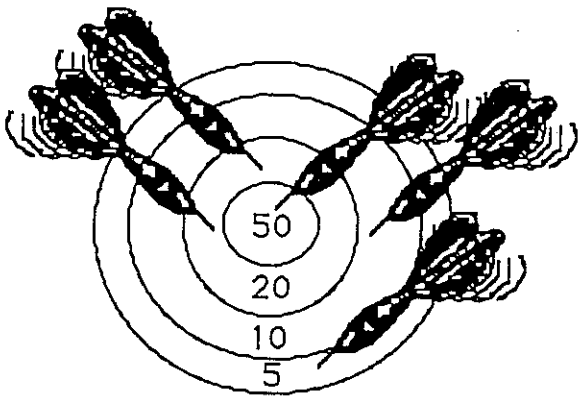
★★★ 3. A machinist converts a metric part to 0.443 inch. The parts only come in fractional sizes given to the nearest 64th of an inch. What is the closest fractional size?

Answer : _____ of an inch

★★ 4. To double check their estimate of the cost of a job, Jack's Painting Company applies the rule of thumb that materials should constitute 20% of the total cost. If the estimate of a job comes to $1011.00, about how much should the materials cost ?

Answer: _____

★★ 5. Robin threw 5 darts, hitting the target and scoring points on each throw. In the picture below he scored 105 points. How many different ways could he get a total score of 120 points?



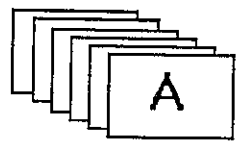
Answer : _____ways

★★ 6. Ms. Fletcher gives her classes a mathematics spelling quiz every Monday, a problem quiz every other Monday, and a mathematics history quiz every third Monday. Ace Jones is in Ms. Fletcher's class, and he received a grade of 100% on all three quizzes today. How many weeks will it be before he again has to take all three quizzes in one day?

Answer: _____weeks

★ 7. Jack is showing Martha a card trick. He has 6 index cards, each one with a letter -- A, B, C, D, E, or F -- typed on it. Every card Jack draws has a letter that is the first letter that is the first letter of the name of a month. What is the probability of Jack drawing three such cards in a row, replacing the card after each draw, without a trick up his sleeve?

Answer : _____



SUNSHINE MATH - 8
Pluto, XVII

Name: _____

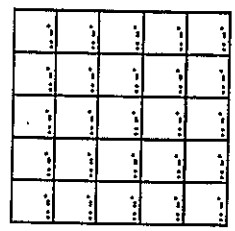
(This shows my own thinking.)

★★★ 1. Name two consecutive prime numbers whose product is 667.

Answer : _____

★★★★ 2. The town library is being refurbished. The design calls for covering a large square floor, 21 feet on each side, with white, teal, and peach tiles. Each tile is 1 foot square. The tile in the center of the floor is to be white, and surrounded by a border of 8 teal tiles. The teal border is to be surrounded by a border of 16 peach tiles. The next border is white, then teal, then peach, and so on.

How many tiles of each color will be used in the floor? At a cost of $2.25 per tile, about how much -- to the nearest $100 -- will these tiles cost if you have to buy 10% more than the number to be used, to account for breakage?



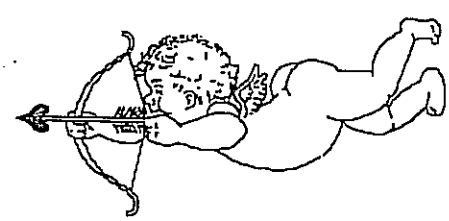
Answer: _____ white tiles; _____ teal tiles; _____ peach tiles

Estimated cost of the tiles: _____

★ 3. You are a subway driver. At the first stop 3 people get on and 2 get off. At the next stop 5 people get on. At the third stop, 4 get off and 3 get on. At the next stop 3 get off and 2 get on. What is the driver's name?

Answer : _____

★★ 4. 300 students attend the Sweetheart Dance on Valentine's Day. The ratio of boys to girls is 6 to 4. If 30 boys and 20 girls leave, what is the new ratio of boys to girls who are still at the dance?



Answer: _____

★ 5. Evaluate $6y^2 - 3x + 5z$ when $x = -2$, $y = 4$, and $z = 10$.

Answer : _____

★★ 6. Jocelyn works in a bakery that serves gourmet muffins in different flavors. In one bakery case there are 15 blueberry, 28 apple cinnamon, 22 banana nut, and 35 blackberry muffins. A customer comes in and asks for any type of muffin that *doesn't* have nuts in it. If Jocelyn reaches into the case without looking, what is the probability she will pull out such a muffin -- one without nuts -- on her first try?

Answer : _____

★★★ 7. Dylan has a Hardy Nickerson poster he wants to frame. The poster is $2\frac{1}{2}$ feet by 4 feet. If he wants a matted border that is 2 inches wide, what size frame, in inches, will he need?

Answer : _____in. by _____ in..

★★ 8. Wanda's average of her first five test scores was 88. Wanda can only find her first four tests now -- those scores were 80, 92, 85, and 97. What did Wanda make on the fifth test?

Answer : _____

★★★★ 9. A magazine has p consecutive pages torn out. Suppose L is the last numbered page before the torn out section and R is the first numbered page after the missing section.

a. Is p always an even number, or an odd number? _____

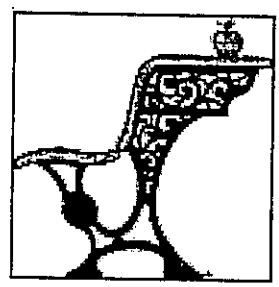
b. Is L always an even number, or an odd number? _____

c. Is R always an even number, or an odd number? _____

d. Write an equation for p in terms of L and R. _____

★★ 10. How many different ways can 48 identical desks be placed in rows if all rows have the same number of desks, each desk is in exactly one row, and no row has more than 20 desks or less than 3 desks ? (Hint: 8 rows with 6 desks is different from 6 rows with 8 desks.)

Answer: _____ ways



SUNSHINE MATH - 8
Pluto, XVIII

Name: _____

(This shows my own thinking.)

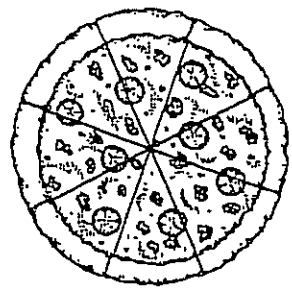
★★★★ 1. Use four 4's, grouping symbols (if needed), and any of the four operations to make all the numbers from 0 through 4.

Answers : 0 = _____ 1 = _____

2 = _____ 3 = _____

4 = _____

★ 2. José is very hungry after doing his mathematics homework. He agrees to pay for $\frac{2}{3}$ of a pizza that he and Charlie ordered. The pizza cost $9.42. How much should José pay ?



Answer: _____

★★★★ 3. Marina works as a teller for the city bank. On a slow day she thought up the following problem:

Using pennies, nickels, and dimes, how many ways can you make change for a quarter?

Help Marina find the answer.

Answer: _____ ways

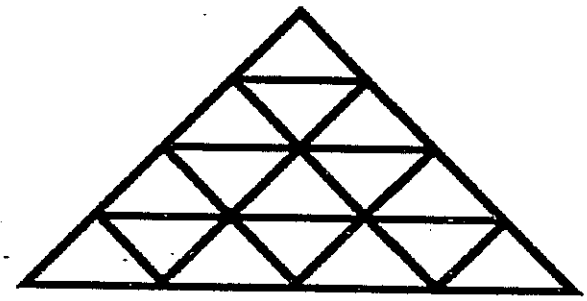
★★ 4. An engineer was working on a design for the electrical system in a new building and obtained a value of 728.57 meters for the length of some wiring. Round this to the nearest:

a) tens
b) units
c) tenth

Answers : a)_____
b)_____
c)_____

★ 5. How many triangles in all?

Answer: _____ total triangles



★★ 6. Write $0.\overline{4}$ (or 0.44444....) as a fraction in lowest terms.

Answer : _____

★★ 7. All other factors being equal, a basketball team should win a game if its players are taller than the opposing team. The heights of Cobb Middle School's starting five are: 5'5"; 5'9"; 5'9"; 6'2" and 6'1". The heights of the starting five for Terraset Middle School are: 5'6"; 5'7"; 5'11"; 6'1", and 6'1". Which team should win because it has the tallest average height?

Answer : _____

★ 8. With Easter approaching, the church needed to buy eggs for the big Easter Egg hunt. The secretary ordered *six dozen dozen* instead of what she was asked to order, *a half dozen dozen*. Did she order the right amount, or too many, or too few eggs?

Answer: _____

★★ 9. A middle school that presently has 600 students has been growing at the rate of 23 students per year for the last decade, and this growth rate should continue for another decade. The student population (P) of the school Y years from now is given by this equation:

$$P = 600 + 23Y$$

a. How many students will the school have in 6 years? _____

b. How many students did the school have 5 years ago? _____

SUNSHINE MATH - 8
Pluto, XIX

Name: _____

(This shows my own thinking.)

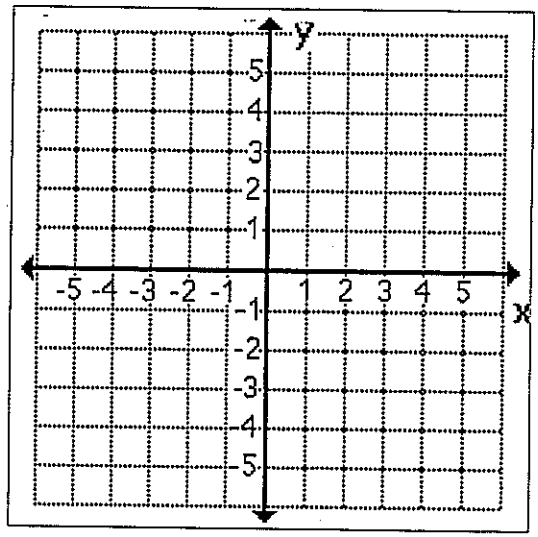
★ 1. Is 1,000,000 minutes closer to 1 year, 2 years, or 3 years?

Answer : _____years

★★★★ 2. Plot these points on the grid and connect them *in order*. You would get a familiar picture, except one of the points is a little off. Which point is wrong, and what should it be? (The picture should be symmetrical about the *y*-axis.)

(-3, 0) › (-2, -2) › (-2, -4) ›
(0, -2) › (2, -4) › (1, -1) ›
(3, 0) › (1, 0) › (0, 3) ›
(-1, 0) › (-3, 0)

Answer: The point _____ is incorrect. It should be the point _____.



★★★ 3. Chad, Missy, Luke and Mary measured their heights. Their heights, not necessarily in order, were 5'3", 5'7", 5'11" , and 5'9". Use the following clues to determine who was 5'9". Missy was taller than Mary, but not the tallest. Luke was taller than Missy, but not as tall as Chad.

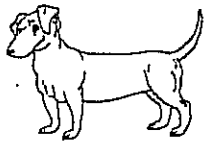
Answer : _____ is 5'9"

★ 4. What geometric term describes a sunburned man? _____

★★★ 5. The highest "stunt dives" ever recorded into an air bag are 360 feet for the male record height, and 180 feet for the female height record. Use $v = 5\sqrt{d}$ to find out approximately how fast each of these divers was traveling when they hit the air bag. (d is distance of the fall in feet, and v is velocity in miles per hour)

Answer: The male was going ____ mph; the female was going ____ mph

★★★ 6. Jessica wants to add a liquid vitamin to her two dogs' food. The veterinarian told her to add 3 mL per 6 pounds of the dog's body weight. How much will she need if Koko weighs 28 lbs.? How much will she need for Big Dog, who weighs 110 lbs.?



Answer : Koko: _____ mL

Big Dog: _____ mL

★★★★ 7. Mr. Bonti is replacing the square tiles in his bathroom. Each new tile is 3 inches longer and 3 inches wider than an old tile. Each new tile covers 39 square inches more than an old tile.

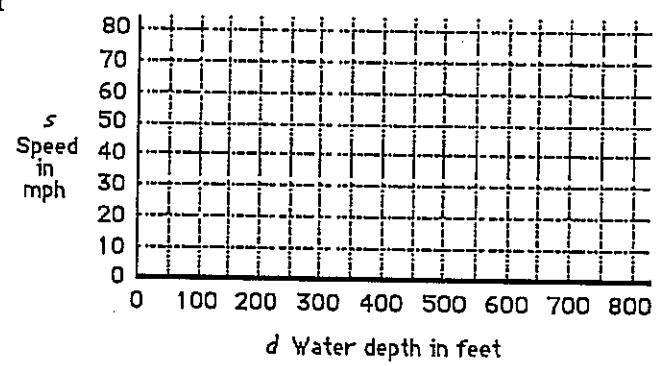
a. How big were the old square tiles?
b. If the area of the room is 5120 square inches, how many new tiles will he need?

Answer : a. ___ in. by ___ in. b. _____ tiles

★★ 8. Tidal waves can travel very fast. Their speed is related to the depth of the water by this function: $s = 2\sqrt{d}$, where speed (s) is in mph and the water depth (d) is in feet.

a. Make and graph ordered pairs (d, s) for each of the multiples of 100 shown on the horizontal axis of the graph.

b. Connect the points with a curve.



★ 9. What is the probability of drawing a card from those pictured where the letter is the first letter of a day of the week ?

Answer : _____

SUNSHINE MATH - 8
Pluto, XX

Name: _____

(This shows my own thinking.)

★★★★ 1. Use four 4's, grouping symbols (if needed), and any of the four operations to make all numbers 6 through 9.

Answers : 6 = _____ 7 = _____

8 = _____ 9 = _____

★★★ 2. Carlos has the 'slow to go' hiccups. The good news is that they are going away. The bad news is that they are still there. When they started, he hiccuped after 1 minute had elapsed, then again after 2 minutes, again after 4 minutes, next after 8 minutes and so on. How many total hiccups did he hiccup in the month of April if they began 12 midnight, April 1st?

Answer : _____ hiccups

★★ 3. Julie, Drew, Alex, and LuAnn are great friends. They want their pictures taken in a group -- one row of four -- but they can't decide who should sit where. How many different arrangements do they have to choose from?

Answer: _____ arrangements

★★ 4. Jackie is a cross country runner. She is in a slump this spring and has won only 6 out of 20 races. How many races must she now win in a row to raise her record to 50%? to 75%?

Answer : _____races for 50%
_____races for 75%

★★ 5. There are 26 members on the baseball team. Of these, 11 can pitch, 6 can play first base, and 5 can do both. How many players can *neither* pitch nor play first base?

Answer: _____ players

★★★ 6. To determine how much of an adult medicine to give a child in an emergency, doctors sometimes use **Young's Rule:**

$$C = \frac{y}{y + 12} \times a$$

where C is the child dosage, y is the child's age in years, and a is the adult dose. Answer these questions about this formula:

a. An adult dosage of medicine X is 200 mg. How much should a 10-year old child take?

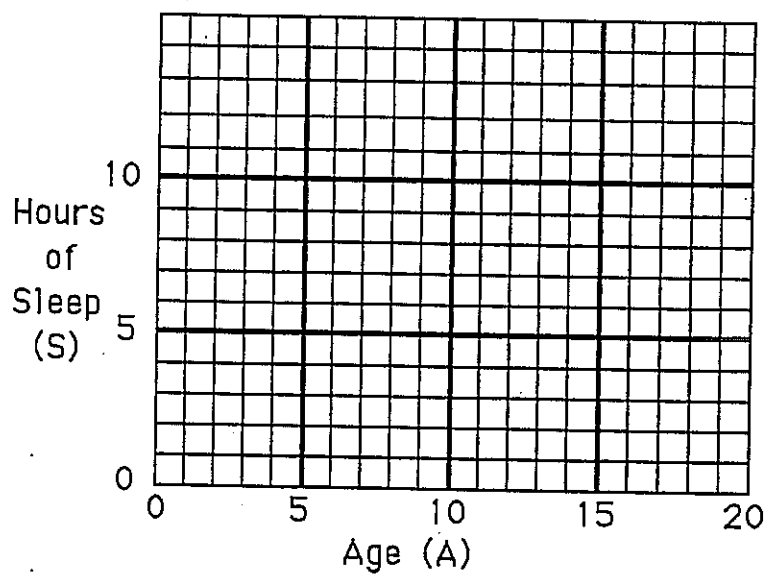
b. An adult dosage of medicine Y is 150 mg. How much should a 12-year old take?

c. Mr. Wynn had to reverse the formula above -- all he had at home was some Children's Bayer Asperin. His 5-year old daughter takes 3 such asperins for a headache -- how many should the 30-year old Mr. Wynn take, to have the same effect?

Answers: a. _____ b. _____ c. _____

★★★★ 7. $S = (32 - A) \div 2$ is used by doctors to say how many hours of sleep a person needs each day, up to age 18. A represents age, and S is the hours of sleep needed. Fill in the chart for the benchmark ages below, and graph the ordered pairs (A, S). Connect your points with a line so that you can predict the sleep needed without the formula. Circle the point on the graph that says how much sleep you should get each night.

A	S
2	
5	
10	
14	
17	



SUNSHINE MATH - 8
Pluto, XXI

Name: _____

(This shows my own thinking.)

★★ 1. Your silverware drawer has 12 forks, 8 knives, and 15 spoons. If you reach into the drawer without looking, how many pieces of silverware do you need to take out to be certain you have 2 matching pieces (2 forks or 2 knives or 2 spoons)?

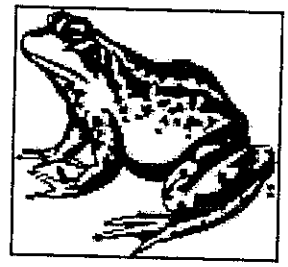
Answer : _____ pieces

★★ 2. Jimmy and Harry started a "running backwards race" at opposite ends of the gym. After 6 seconds they passed each other at the center of the gym. If they lost no time in turning and kept the same speed, how long after starting would they pass each other again?

Answer : _____ seconds

★ 3. The longest frog leap on record was by Ex Lax at the 1975 Calavaras County Jumping Frog Jubilee. It measured 17 feet, 7 inches. How much longer is this than the human record for the standing long jump -- a mere 12 feet, $2\frac{1}{4}$ inches?

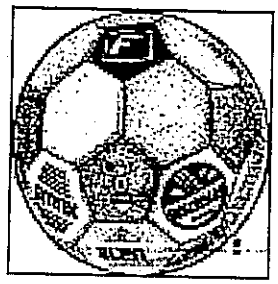
Answer: _____ longer



★★★★ 4. Every year on my birthday, an unusual phenomenon occurs which I note will no longer apply as of the year 2000. In fact, it will not recur until the year 2100, on the first of February. Identify this phenomenon, and you will know my birthday. What is the month and day of my birthday?

Answer: _____

★★★ 5. Thirty-two people went to see the U.S. play World Cup soccer in Orlando. Four people rode to the game in each car and 8 people rode the bus. On the way home, 3 people rode in each car and the rest rode the bus. How many people rode the bus on the way home?



Answer : _____ people

★ 6. A raft has a weight limit of 500 lbs. Ron weighs 178 lbs., Katie weighs 132 lbs., Jethro weighs 195 lbs., and Amie weighs 118 lbs. Who stayed on shore if the heaviest possible crew, without exceeding the weight limit, took the raft out on the lake?

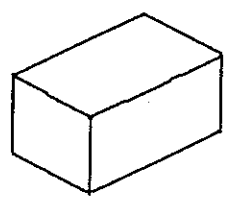
Answer : _____ stayed.

★ 7. There are 215 people in a theater watching Batman Forever. The usher polls each viewer as they leave the theater and 195 people said they "really liked" the film. To the nearest whole percent, what percent of the viewers did not "really like" the film?

Answer : _____

★★★ 8. Rolanda wanted to recover her storage chest with some floral paper. It's shaped like a rectangular solid. The volume of the box is 9 cubic feet. Its length is 3 feet and its width is 2 feet. How many square inches of wallpaper will Rolanda need to cover the sides if she doesn't cover the bottom ?

Answer : _____ sq. inches



★ 9. Zydeco has $30 and is shopping for her boyfriend's birthday. She sees several things she would like to buy: a C.D. for $15.95, a book for $4.90, a pair of shorts for $12.98 and a poster for $2.35. Which three items does she have enough money to purchase?

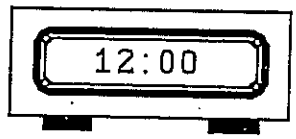
Answer : _____

SUNSHINE MATH - 8
Pluto, XXII

Name: _____

(This shows my own thinking.)

★★ 1. On a digital clock showing hours and minutes, how many different readings between noon and 6 P.M. contain at least two 4's?

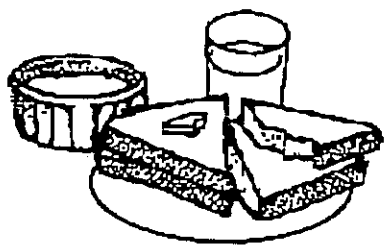


Answer: _____ readings

★★★ 2. A person who wins a $1 million lottery usually gets the money spread out in equal increments over 20 years. Also, the government takes 28% off the top, for taxes. If you won such a lottery, how much could you expect to get each year, after taxes for each of the 20 years?

Answer: _____

★★ 3. A school year is usually 180 days long. If you bought your lunch from the cafeteria every school day during your whole K-12 years, and the average cost was $1.35 per meal, how much would you spend for school lunches? Assume you never missed a day.



Answer: $ _____

★★★★ 4. Light travels at the "speed limit" for the universe -- 186,000 miles per second.

a. The sun is 93,000,000 miles from earth. How long does it take for light to get from the sun, to earth? Answer: _____ minutes

b. Scientists use the term *light year* to describe distances in the universe. The nearest star to earth is $4\frac{1}{2}$ light years away. In miles, about how far away is the nearest star?

Answer: _____ miles

★★★ 5. For coin-collectors, coins are graded on a scale of from 1 to 70 with a score of 70 being perfect. Bob has a coin graded 56. Percentage-wise, how far is it from being perfect?

Answer: _____ %

★★ 6. One coin collector found a coin dated 232 B.C. What can you say about such a coin?

Answer: _____

★★★★ 7. A popular formula for a person's arm strength S is:

$$S = (d + p)(\frac{w}{10} + h - 60), \text{ where:}$$

d is dips on a parallel bar	p is pull ups
w is weight in pounds	h is height in inches

Compute S for these students. Place them in order from strongest to weakest.

a. Dorrie: 5 dips, 7 pull ups, 140 pounds, 66 inches tall.

b. Reynaldo: 6 dips, 4 pull ups, 130 pounds, 70 inches tall.

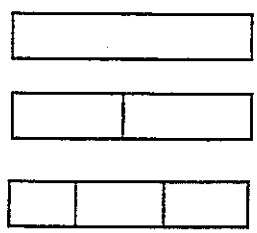
c. Rocky: 2 dips, 3 pull ups, 120 pounds, 64 inches tall.

d. Evelyn: 6 dips, 8 pull ups, 110 pounds, 62 inches tall.

Answer:
From strongest to weakest, they are: _____, _____, _____, _____

★★★★ 8. To the right is a rectangle. The picture below it shows that 1 vertical line produces 3 rectangles, the original plus two smaller ones. The picture below that shows that 2 vertical lines will produce 6 rectangles. Continue with this pattern by drawing a few more such rectangles.

a. How many rectangles do you get with 3 vertical lines? _____
b. How many rectangles do you get with 4 vertical lines? _____
c. How many rectangles do you get with 5 vertical lines? _____
d. How many rectangles do you get with 100 vertical lines? _____

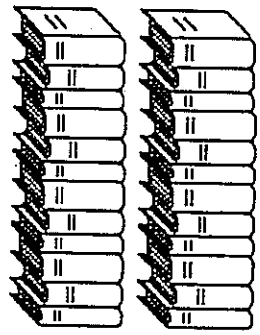


SUNSHINE MATH - 8
Pluto, XXIII

Name: _____

(This shows my own thinking.)

★★ 1. Mrs. Thomas had 12 math books in each of 2 stacks. Her young daughter was staying with her after school one day, so she gave her the challenge of putting the books in 3 stacks so that:



- the first stack had one less than the third stack, and
- the third stack had one less than the middle stack.

How many books should be in each stack?

Answer : 1st stack: ___ ; 2nd stack: ____ ; 3rd stack: ____

★★ 2. The Fahrenheit temperature (T)under the earth's surface is given by $T = 68 + 40k$, for each kilometer k in depth.

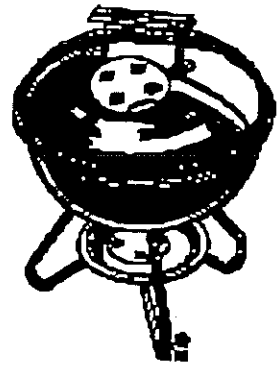
a. What temperature would you find at the bottom of a 1-kilometer mine shaft?

b. How far down would you have to go before you could boil water at 212° F?

Answers: a. _____ b. _____

★ 3. Shania needs some ketchup for her family's barbecue. She's comparing prices at the store and finds that a 12-oz. bottle of ketchup is $1.38 and an 8-oz. bottle is $1.02. Which is the best buy?

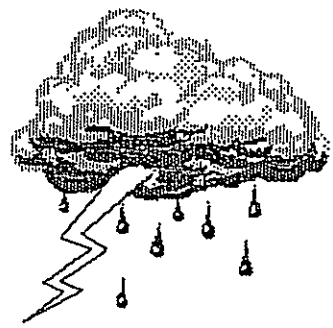
Answer: _____ oz. bottle



★★★★ 4. A compact disk has a $4\frac{1}{2}$ inch diameter. The outer non-playing margin is $\frac{1}{4}$ inch wide, and the non-playing central area is 1 inch in diameter. There are an average of 120 grooves per inch. What is the area of the playing section?

Answer : _____sq. inches

★★ 5. The chance of rain on Saturday is given by the weatherman as 50%. The chance of rain on Sunday is also 50%. What is the chance that you will make it through the weekend without rain messing up your plans?



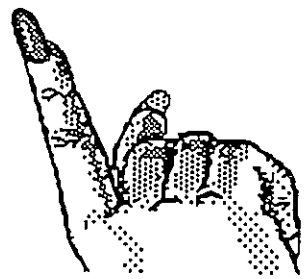
Answer : _____

★★ 6. Fingernails grow about 1.5 inches per year.

a. Measure the length of your index fingernail. What is it?

b. Write an equation, using y for years, that tells how long (L) your fingernail will be y years from now.

c. The longest fingernail on record is 37 inches. How many years from today will it take for your fingernail to equal the record?



Answers: a. _____ inches b. $L =$ _____ c. _____ years

★★★ 7. Bees travel about one hundred forty thousand miles as they make a pound of honey. About three million pounds of honey are produced in the United states and Canada each year. Determine about how far bees had to travel to make all the honey in the United States and Canada in 1996. Write your answer in scientific notation.

Answer : _____ miles

★★ 8. The smallest bacteria that can be seen with an ordinary microscope is 0.00002 centimeters in length. Write this number in scientific notation.

Answer : _____ centimeters

★★★ 9. One of two 6-sided dice has a blank face rather than a face with 2 dots. The other die has a blank face rather than a face with 5 dots. What is the probability that a sum of seven appears when the dice are thrown?

Answer : _____

SUNSHINE MATH - 8
Pluto, XXIV

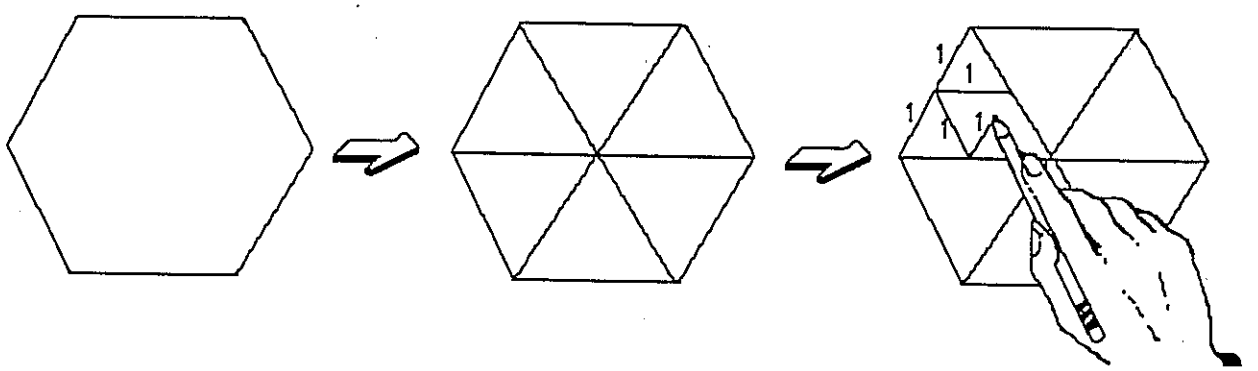
Name: _____

(This shows my own thinking.)

★★★ 1. A regular hexagon can be divided into six equilateral triangles by connecting the opposite vertices.

a) If the side of the original hexagon is 2 inches, how many non-overlapping equilateral triangles with sides of 1 inch can be drawn inside the hexagon? Answer: _____

b) If the side of the original hexagon is 4 inches, how many equilateral triangles with sides of 1 inch can be drawn? Answer: _____



★★★ 2. The volume of a sphere is given by $V = \frac{4}{3}\pi r^3$. The earth's radius is about 4000 miles. The sun's radius is about 433,000 miles. Answer (a) and (b) below using scientific notation:

a. What is the approximate volume of the earth?_____ mi^3

b. What is the approximate volume of the sun? _____ mi^3

c. How many earths would fill up the sun? _____

★ 3. Justin has 13 coins in his pocket that total $1. What coins does he have?

Answer: ___ pennies, ____ nickels, ____ dimes, ____ quarters

★★ 4. A fast stamp machine can make 360 stamps in 3 seconds. How many stamps can such a machine make in a normal, eight hour workday?

Answer : _____stamps

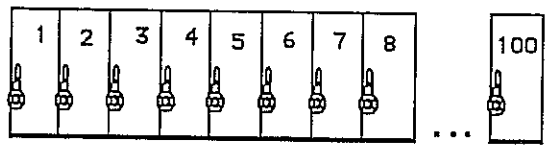
★★★★ 5. The school policy is to open student lockers regularly to check for illegal items. The following pattern is followed from September through May:

September: Open {2, 4, 6, 8, ..., $2n$, ...}

October: Open {3, 6, 9, 12, ..., $3n$, ...}

November: Open {4, 8, 12, 16, ...,$4n$, ...}

December: Open {5,10,15, 20, ...,$5n$, ...}



a Which locker would be opened most often? _____

b. Which lockers from 1-100 would never be opened? _____

_____

★★ 6. Juanita spent half of her money on a new skirt. She then spent half of the remaining amount on a new blouse and lunch. If she had $11.00 left at the end of the day, how much money did she start with?

Answer : $_____

★ 7. A sign in a department store says, "Sale! All C.D. players are now 25 % off!" George wants a C.D. player that was originally $240.00. He can calculate the price he has to pay by multiplying $240 by which fraction?

Answer : _____

SUNSHINE MATH - 8
Pluto, XXV

Name: _____

(This shows my own thinking.)

★★★ 1. Coach LeBeau ordered jerseys for his soccer team. The company he is ordering from is having a 25% off sale. Coach will receive another 8% off because of the size of the order and another 5% off for paying cash. The discounts are taken one after the other. If Coach LeBeau paid $210.85, what was the original price before the discounts?

Answer: _____

★ 2. Find this product: $2.658 \times -217.95 \times \frac{758}{1395} \times 0 \times 1.5094 \times -13\frac{2}{3}$.

Answer : _____

★★★★ 3. Suppose that your favorite uncle put $1,000 in the bank for you the day you were born. The bank account draws 10% simple interest at the end of each year. The interest earned is added back into the account. Use a calculator to find out how much you would have:

a. at age 5
b. at age 10
c. at age 15
d. at age 21, when you can remove it

Answers: (a) _____ (b) _____ (c) _____ (d) _____

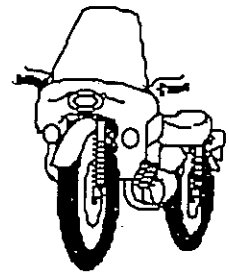
★★★ 4. Ann's and Joan's birthdays were approaching, so Harry, Pam, Beth, and Andy wanted to treat them to lunch as a gift. They both agreed to go, but Ann wanted to chip in her fair share to help buy Joan's meal, and Joan wanted to do likewise for Ann's meal. If the total came to $54, including tax and tip, what would be fair for each person to pay?

Answer : Harry, Pam, Andy and Beth should each pay $_____
Joan and Ann should each pay $ _____.

★★★★ 5. Ben printed a flyer to encourage people to vote for him for student council. He used a "chain letter" system where each person who received the flyer agreed to copy it and give the flyer to 5 more students who had not gotten one, within an hour. He passed out the first copy to five friends at 8:00 AM. How much time had elapsed before he could be sure the whole student body of 853 students had gotten his flyer?

Answer : _____ hours

★★★ 6. Scott drove his new motorcycle to Atlanta for vacation. He traveled at 80 km per hour for 56 km, 75 km per hour for 60 km, and 92 km per hour for 46 km. What is the average rate of speed over the entire trip?



Answer: _____ km/hour

★★ 7. Find five consecutive even integers whose sum is -250.

Answer : _____

★★ 8. Try this number trick:

Take the number of people living in your house, and double it.
Add 5, then multiply the result by 10.
Subtract 50.
Divide by twice as many people as live in your house.

Write your answer here: _____

★★★ 9. Nikita earns $4.50 an hour for her first 40 hours each week, and "time and a half" for every hour beyond 40. She worked 46 hours the week between Christmas and New Year's. How much money did she make?

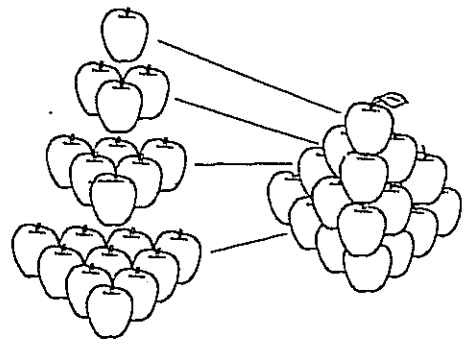
Answer: _____

SUNSHINE MATH - 8
Pluto, XXVI

Name: _____

(This shows my own thinking.)

★★★★ 1. Mr. Nielsen, a grocer, stacks all of his apples in triangular pyramids. Each layer of apples is in the shape of an equilateral triangle, and the top layer is a single apple.



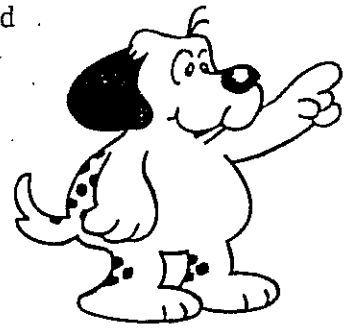
a. How many apples are in a stack four layers high? _____

b. How many apples are in a stack five layers high? _____

c. How many apples are in a stack six layers high? _____

d. How many apples are in a stack ten layers high? _____

★★★★ 2. Every day, I count the fleas on my dog. The first day he had 1 flea, the second day 3, the third day 5, then 7, then 9, and so on.



a. How many fleas were there on the 100th day?

Answer: _____

b. Write an algebraic expression for the number of fleas on the *nth* day:

Answer: _____

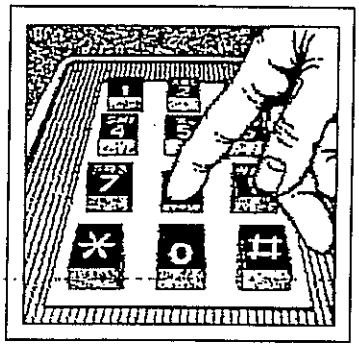
★ 3. 1×10^{-4} meters is the thickness of a piece of paper. Write this measurement as a decimal.

Answer : _____ meters

★ 4. What fraction of the letters in the word *multiply* are also in the word *product*?

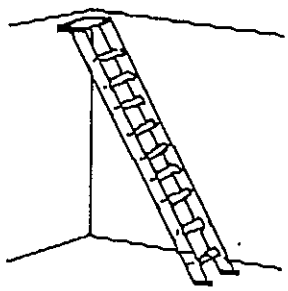
Answer : _____

★★★★ 5. Telephone area codes have three digits. The first digit must be chosen from 2 through 9. The second digit must be a 0 or a 1. The third digit cannot be 0. How many area codes are possible?



Answer : _____area codes

★★ 6. A 25-foot ladder is placed against the top of an inside wall 20 feet high. How far out from the wall will the foot of the ladder be placed?



Answer : _____ feet

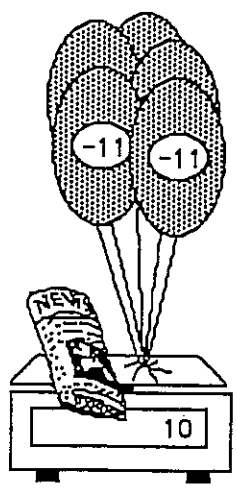
★★ 7. Five identical helium balloons are shown on the scale. They have negative weights since they pull up. Use n to stand for the weight of the newspaper.

a. Write an equation for this situation.

Answer: _____

b. Intuitively, find the weight of the newspaper.

Answer: _____



SUNSHINE MATH - 8
Pluto, XXVII

Name: _____

(This shows my own thinking.)

★ 1. Replace O, N, E, T, and W with numerals to make a true equation.

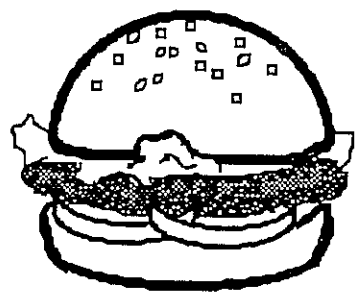
```
  O N E
+ O N E
-------
  T W O
```

Answer : ❑❑❑ + ❑❑❑ = ❑❑❑

★★★ 2. Find the number represented by *N*. Begin with 512. Divide by 16. Divide by *N*. Add 256. The result is 320.

Answer : _____ = *N*

★★ 3. Charles needs 100 hamburger buns for his party. They come in packages of 8 for $1.10 and 6 for $0.90. To spend the least amount of money and have enough buns he should buy:



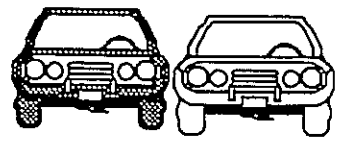
a. 10 packages of 8 and 4 packages of 6
b. 11 packages of 6 and 7 packages of 8
c. 13 packages of 8
d. 17 packages of 6

Answer: _____

★★★★ 4. Ralph has 5 baseball trophies, 4 tennis trophies, and 3 soccer trophies. He wants to arrange them on a shelf in the family room so that all the baseball trophies are together on the left end, and all the tennis trophies are together in the middle. How many different arrangements of the trophies on the shelf are possible?

Answer : _____ different arrangements

★ 5. Two cars are driving next to each other in 2 lanes from New Port Richey to Weeki Wachee. Both cars leave New Port Richey at the same time, and travel the same speed. Yet one car takes 90 minutes to arrive, while the other takes 1 hour and 30 minutes. Explain why.



Answer: _____

★ 6. Last year the 8th grade class raised $86.75, $42.50, $105.00, and $70.50 at four car washes. They plan on having more car wash fund raisers this year. On the average, how much should they plan on raising at each car wash?

Answer : $_____

★★ 7. A number of campers are standing in a circle at summer camp, evenly spaced. They begin to "count off," starting with 1. Camper number 5 hears the one directly opposite her count "seventeen" but is distracted by a bug crawling on her leg. Later she wanted to tell her Dad about the game they played, and quickly figured out how many campers were in the circle. What was the number?

Answer : _____ campers

★★ 8. Marcus' Dad made $42,000 a year in 1993. He was forced to take a 10% pay cut the following year due to the company losing business. The next year, the company did well again and said it was giving all its employees a 10% raise for their loyalty during the hard times. After the 10% cut and a 10% raise, how much was Marcus' Dad to make?

Answer: $_____ per year