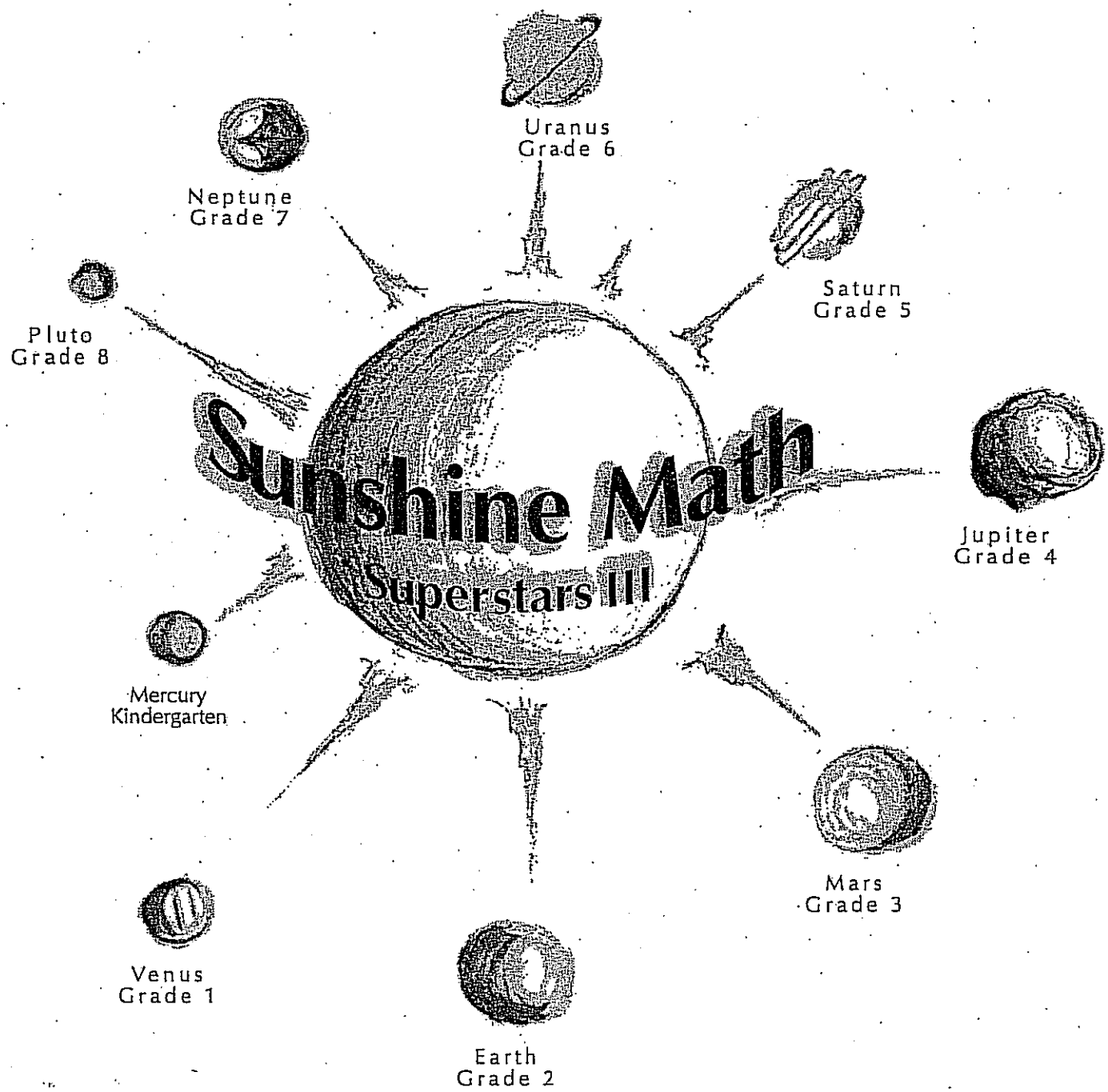

Neptune
Grade 7

Acknowledgments

This project was conceived of and coordinated by the Florida Department of Education. In addition, it was supported financially through a grant to the School Board of Polk County. The rich history of these materials and the predecessor programs *Superstars* and *Superstars II*, goes back to the early 1980's. Dr. Andy Reeves initiated the program at the Department of Education, and many Florida teachers have been involved in developing and using these materials over the years.

The following Florida educators were primarily responsible for developing, field testing, and publishing *Sunshine Math*:

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Revisions were made to *Sunshine Math* by Sandy Berger, Frankie Mack and Linda Fisher with input from Andy Reeves and from volunteers and district staff in Broward, Duval, and Volusia school districts.

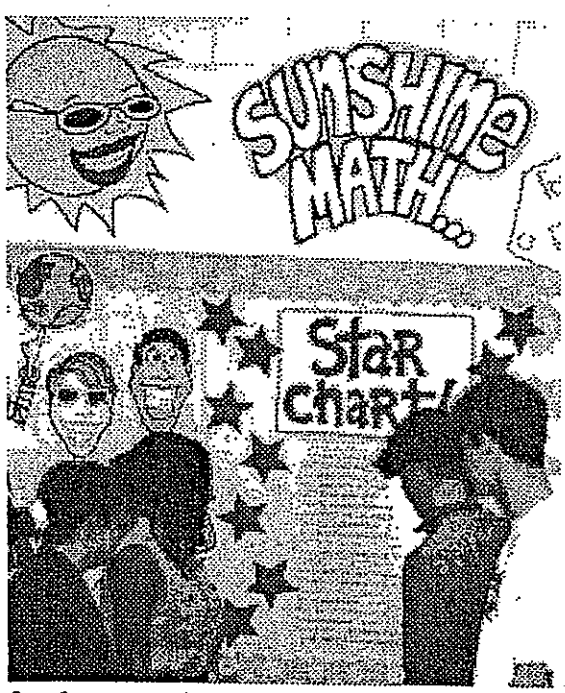
Additional copies of *Sunshine Math* may be purchased at cost from the Panhandle Area Educational Consortium (PAEC), 753 West Boulevard, Chipley, Florida 32428, or by contacting the PAEC Distribution Center:

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*.

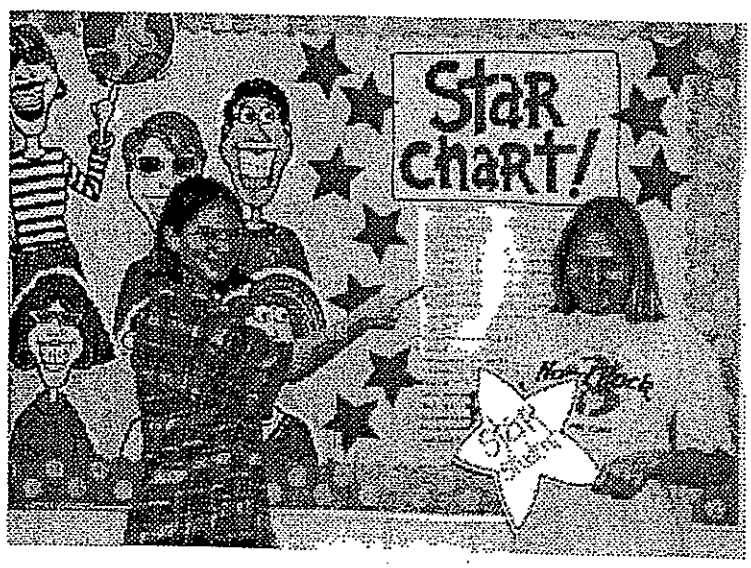
Variations of the Basic Model

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

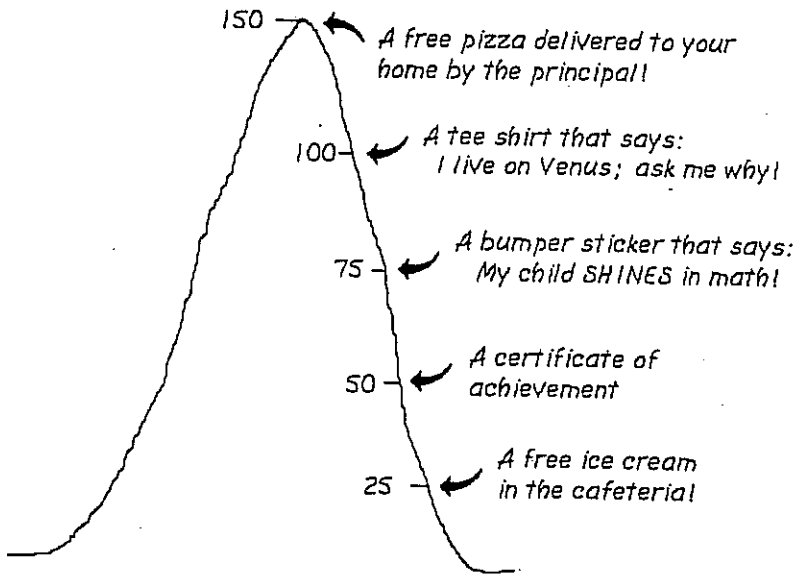
Sunshine Math is a K-8 enrichment package for mathematics, designed to be managed by volunteer assisting adults with coordinated support from the classroom teacher and school administrators. The purpose of the program is to give self-motivated students of all ability levels a chance to extend themselves 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:

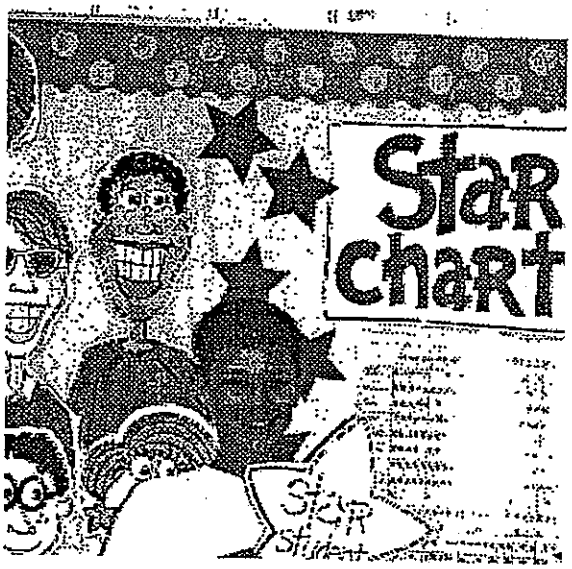


Climb the Mountain this Year!!!

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.

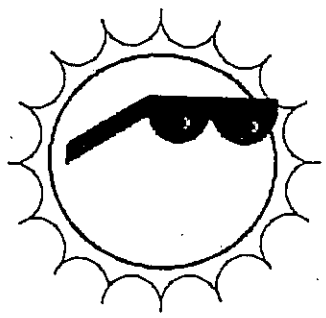
❑ Keep all returned worksheets. As the same worksheets are used year-after-year, and many participating students have siblings who will later be in *Sunshine Math*, it is important that the students not be allowed to keep their worksheets.

❑ 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 - 7
Neptune, I

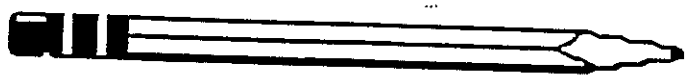
Name: _____

(This shows my own thinking.)

★ 1. A student scores 85, 79, 92 and 100 on her math quizzes. What was her average grade?

Answer: _____

★★ 2. Stella bought 4 pencils at the school bookstore. She gave the clerk $2 and received 16¢ in change. How much did she pay for each pencil?

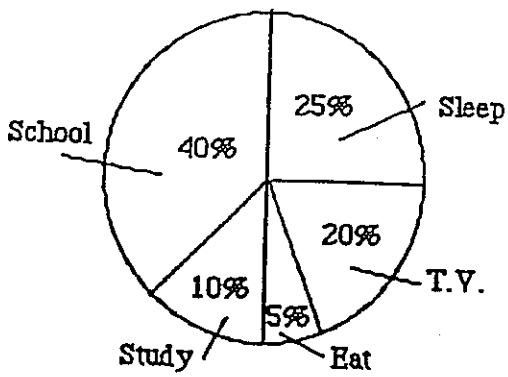


Answer: _____

★★ 3. The circle graph shows Tom's daily activities, and the percentage of time he spends on each.

a. Which two activities together take up half Tom's time?

b. Which activity takes twice as much time as studying?



Answer: a. _____ and _____

b. _____

★★★★ 4. Russell, a seventh grader, finds out the winner of the school talent show at 4:00 P.M. on Friday. He calls two seventh grade friends at 4:15 P.M. to tell them. By 4:30 P.M. they each call two 7th grade friends. If each person who is called calls two more 7th graders every fifteen minutes, when will all 176 seventh grade students know the winner?

Answer: _____

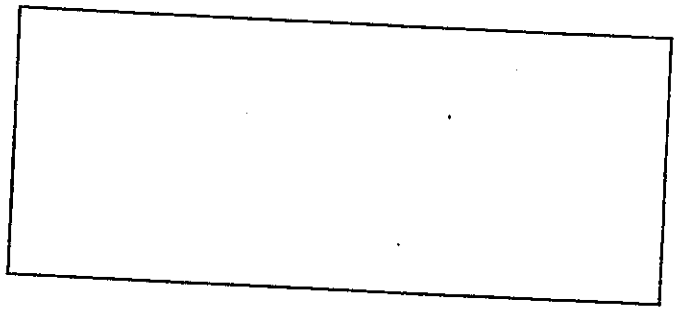
★ 5. One number is 7 less than another. Their product is 60. What are the two numbers?

Answer: ____ and ____

★★★ 6. How many different whole numbers can be made with the digits 1, 2, and 3? Any number you make can have 1, 2, or 3 digits in it but you may not repeat a digit in any one number.

Answer: _____

★★ 7. A rectangular yard 80 feet by 60 feet has a fence with a post on every corner and another post every five feet. How many posts are needed for the entire fence? Use the drawing below if it helps.



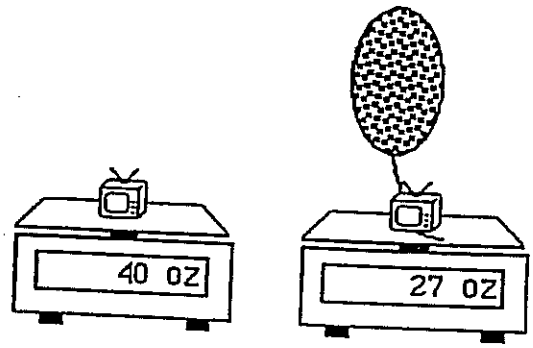
Answer: _____

★★ 8. The blueprint for landscaping a yard has a scale of 1/2" to 1 foot. If the blueprint is a rectangle 18 inches by 22 inches, what are the dimensions of the yard?

Answer: _____

★★★ 9. A miniature television is placed on a scale as shown to the right. Then a helium balloon is added. The helium balloon has negative weight since it pulls up on the scale. What is the weight of the helium balloon?

Answer: _____

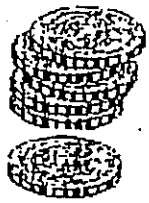


SUNSHINE MATH - 7
Neptune, II

Name: _____

(This shows my own thinking.)

★★ 1. How many different ways can \$0.50 be made with fewer than 8 coins?



Answer : _____

★★ 2. What integer between 10 and 20 is a solution to $(x - 4) + (x + 8) = 36$?

Answer : _____

★★ 3. A punch recipe calls for 2 quarts of orange juice, $1\frac{1}{2}$ quarts of apple juice, and $1\frac{1}{2}$ quarts of soda water. How many cups of punch will this recipe make?

Answer: _____

★★ 4. Find a pattern and then write the next two terms according to your pattern.

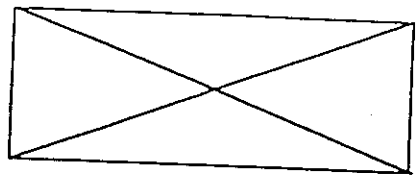
5, 6, 8, 9, 11, 12, 14, 15, 17, 18, ...

Answer: ____ and ____

★★ 5. In the pattern above, what two numbers would come before 5?

Answer: ____ and ____

★ 6. Two diagonals are drawn in the rectangle. How many acute angles are there altogether?



Answer: _____

★★ 7. Lisa, Drew, David and Kelly are 11, 12, 13 and 14 years old. David is older than Kelly and younger than Lisa. Drew is younger than David and older than Kelly. How old is each? Use the chart if it helps you.

	11	12	13	14
Lisa				
Drew				
David				
Kelly				

Answer: Lisa is ____, Drew is ____, David is ____, and Kelly is ____.

★★★★ 8. Cindy and Bill spend part of their summer vacation at the cottage at the lake. Their mom and dad are very busy in the city, but the children would like to stay at the cottage longer and longer every summer. A new pizza restaurant opened at the lake that served pizzas with different toppings. Mom said that they could stay as many days as the number of different orders of two topping pizzas. With the following toppings, how long can they stay?

Pepperoni	Sausage	Meatball	Salami	Garlic
Mushroom	Onion	Green Pepper	Tomato	Pineapple
Bacon	Avocado	Tuna Fish	Ham	

Answer: _____

★★★ 9. You won the lottery! You have so much money that you decide to give $2,000,000 away. If you give $50 away every hour, how long will it take you in years?

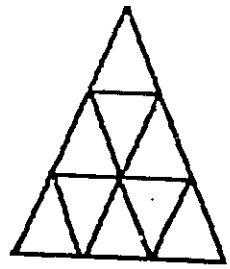
Answer: _____

SUNSHINE MATH - 7
Neptune, III

Name: _____

(This shows my own thinking.)

★ 1. How many triangles are in this drawing?



Answer: _____

★★ 2. Insert parentheses in the following sentence to make it true.

$$40 - 6 \times 6 - 2 - 6 = 10$$

★★★ 3. The telephone company has 25 computer-controlled switching systems. Each system handles 700,000 calls an hour. The system works with 95% accuracy. How many calls would <u>not</u> be accurately handled in one day?

Answer: _____

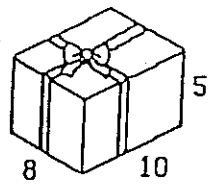
★ 4. You stop for lunch with your family on the way to the football game. The total bill for lunch is $15.00. The service is good so you would like to leave the server approximately 20% as a tip. The game is ready to begin, so you quickly figure about how much you should leave! How much is it?

Answer: _____

★★ 5. Spaghetti costs 99¢ a pound. A jar of sauce costs $2.59 and garlic bread is 2 loaves for $1.39. You have invited friends for dinner and you need 2 pounds of spaghetti, 2 jars of sauce and 3 loaves of bread. To the nearest dollar, how much will it cost?

Answer: _____

★★★★ 6. Ricardo wants to cover this 8" by 10" by 5" box with contact paper. How many square inches of contact paper will he need? How much ribbon will he need if the bow itself adds 15 inches?



Answer: _____ sq. in. of contact paper and ____ inches of ribbon

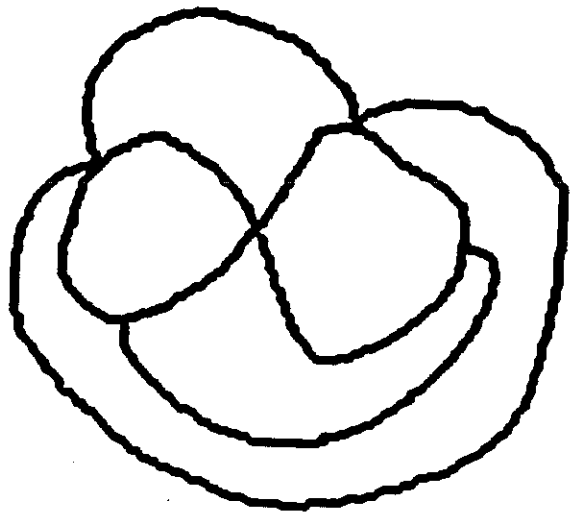
★★ 7. On the same day in early June, the temperature in Miami, Florida, was 88°F and the temperature in Nome, Alaska was -6° F. How much warmer was it in Miami?

Answer: _____

★★ 8. Fabian bought 6 notebooks at the school bookstore. He gave the clerk $6. If two notebooks cost $1.77, and the sales tax was 6%, how much change should he receive?

Answer: _____

★★ 9. If you start in the right place on this figure, you can trace the whole path without lifting your pencil and without retracing any path. Circle a place to start to do this. You get two stars if you can circle both places where you can start and accomplish this task.



SUNSHINE MATH - 7
Neptune, IV

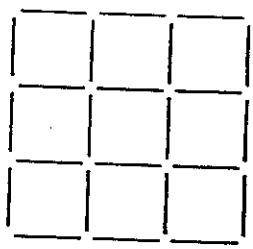
Name: _____

(This shows my own thinking.)

★ 1. Sam has to be at work at 6 P.M. He leaves his house at 4:10 P.M. and it takes him 20 minutes to drive to the library. It takes him 25 minutes to drive from the library to work. How much time can he spend at the library?

Answer: _____

★★ 2. Remove 8 toothpicks and leave 2 squares. Show the ones to remove by making an ✗ through them.



★★★ 3. Stamps come in large sheets with perforations in between. How many different ways can you buy 4 attached square stamps? (Two ways to put them together are considered *the same* if one way can be turned or flipped so that its outline looks like the other way.)

Answer: _____ ways

★★★ 4. A video arcade offers 6 free games to first time customers. Each game costs $.75 with a free game for every four you buy. How many games could you play for $3.00 the first time you are a customer?

Answer:: _____ games

★★ 5. Apples sell for $1.29 a pound, and there is an average of 3 apples per pound. About how many apples would you expect to get for $5.00?

Answer: _____ 🍎s

★★ 6. A number x is increased by 27 and the result is multiplied by 6, giving 372 as the result.

What was the original number x? _____

★★★★ 7. A gymnast received the following scores from 5 judges in the state competition:

floor:	8.8, 9.3, 8.1, 8.9, 9.5
bars:	7.6, 8.2, 8.5, 8.2, 8.9
vault:	9.5, 8.9, 9.4, 9.5, 9.0
beam:	8.4, 8.5, 8.4, 7.9, 8.7

Her score for each event is found by computing the average *after* the high and low score is thrown out and rounding to the nearest hundredth.

✔ What was her score on each event?

floor: _____ bars: _____ vault: _____ beam: _____

✔ What was her worst event? _____

✔ What was her best event? _____

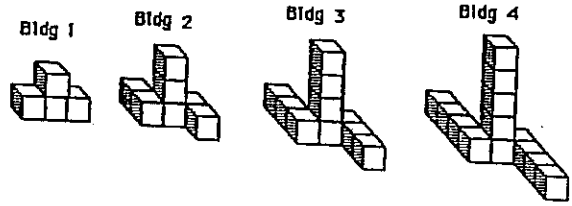
✔ What was her total score for the day, all 4 events combined? _____

★★★ 8. How many 22 centimeter pieces of string can be cut from a 4.2 meter piece of string? How many centimeters are left over?

Answer : _____ pieces with _____ cm left over.

★★★★ 9. Some buildings are shown below. If the builder continues this same pattern:

How tall will the tower be in Building 100? _____ blocks high
How long will each of the two wings be in Building 500?_____ blocks long
How many blocks will it take to make Building 1000? _____ blocks
How many blocks will it take to make Building ***n***, where ***n*** can be any whole number? _____



SUNSHINE MATH - 7
Neptune, V

Name: _____

(This shows my own thinking.)

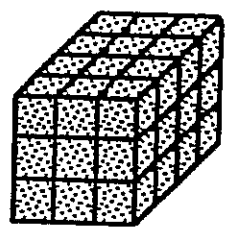
★★ 1. What is 10% of 20% of 30% of 100?

Answer:_____

★ 2. The hundreds digit of a three digit number is $\frac{1}{3}$ of the ones digit and twice the tens digit. What is the number?

Answer:_____

★★ 3. How many small cubes are used to make this solid prism?



Answer:_____

★★★ 4. If the above prism was dipped in green paint, how many small cubes would not have any paint on them?

Answer:_____

★★★ 5. A snail starts at the bottom of a 20-foot well. Each day he climbs up $4\frac{1}{2}$ feet, but at night slips back 2 feet. How many days will it take to reach the top of the well?

Answer:_____

★★ 6. The highest point in Florida is in Walton county. It is 345 ft. *above* sea level. Sombrero Key is 30 ft *below* sea level. What is the difference, in feet, between these two points?

Answer: _____

★★★★ 7. A jar contains 48 marbles, identical except for color. There are twice as many yellow as red marbles and twice as many blue as white marbles. There are 6 more white marbles than red marbles. What is the probability of drawing at random a yellow marble from the jar?

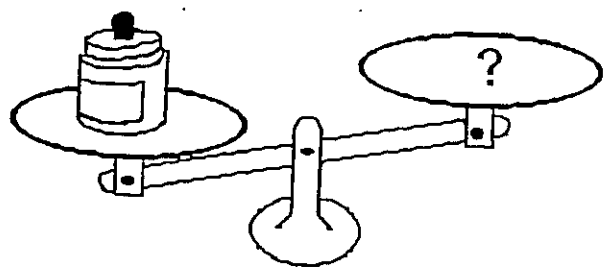
Answer:_____

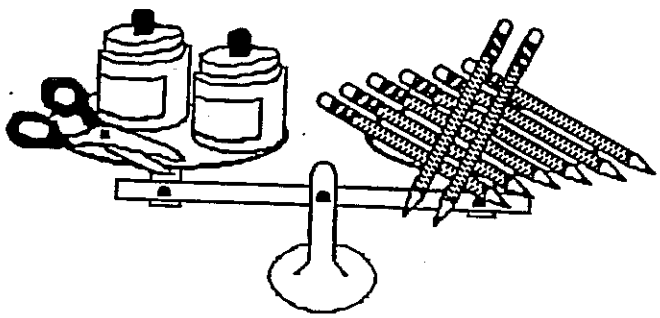
★ 8. Add one operation sign (+, -, x, or ÷) to make this mathematics statement true.

7 0 4 3 8 4 = 7 1 2 7

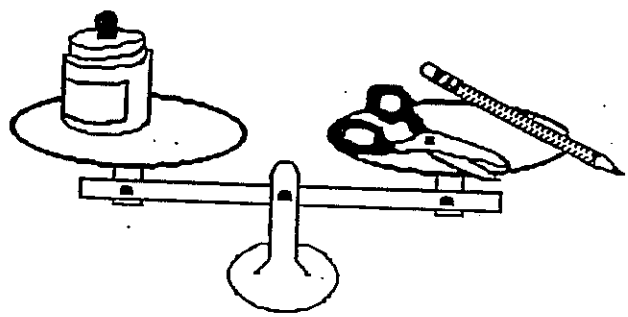
★★★★ 9. How many pencils does it take to balance the jar of paste, given the information below?

Answer: It takes _____ pencils to balance the paste.





1 pair of scissors and 2 jars of paste balance 8 pencils.



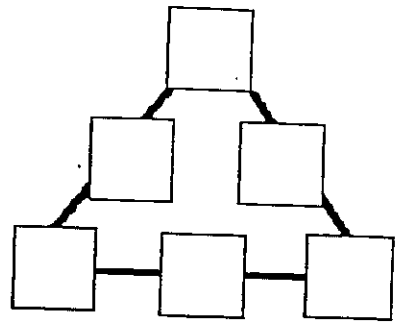
1 jar of paste balances 1 pair of scissors and 1 pencil.

SUNSHINE MATH - 7
Neptune, VI

Name: _____

(This shows my own thinking.)

★ 1. Use the fractions $\frac{5}{6}$, $\frac{1}{3}$, $\frac{1}{2}$, $\frac{1}{6}$, $\frac{2}{3}$, and 1 so the sum of each side of the triangle is 2.



★ 2. The football team played fifteen games this season and won three more games than it lost. How many games did the team lose?

Answer: _____

★★★ 3. Look for a pattern. Use the pattern to predict the value of 999,999,999 x 9.

222,222,222 x 9 = 1,999,999,998
333,333,333 x 9 = 2,999,999,997
444,444,444 x 9 = 3,999,999,996

Answer: 999,999,999 x 9 = _____

★★ 4. If three math students do 3 math problems in 3 minutes, how long will it take 33 students to do 33 problems? (The students are splitting the task.)

Answer: _____

★ 5. You are ordering pizza for 10 people. Each pizza has 8 slices. What is the fewest number of pizzas to order so that everyone gets the same number of whole slices?

Answer: _____

★★ 6. Add only one arithmetic sign (+ , -, x, ÷) to make the mathematics sentence true.

$$9\ 3\ 4\ 4\ 6\ 3 = 4\ 3\ 2\ 4\ 4\ 2$$

★★★ 7. What three consecutive numbers have a sum which is $\frac{1}{5}$ of their product?

Answer: _____

★★★★ 8. Rose bought some donuts. She gave $\frac{1}{2}$ of her donuts and $\frac{1}{2}$ of a donut to her mom. Then she gave $\frac{1}{2}$ her remaining donuts and $\frac{1}{2}$ of a donut to her brother. Then she gave $\frac{1}{2}$ her remaining donuts and $\frac{1}{2}$ of a donut to her sister. This left her with $\frac{1}{4}$ dozen donuts. How many donuts did Rose originally buy?

Answer: _____

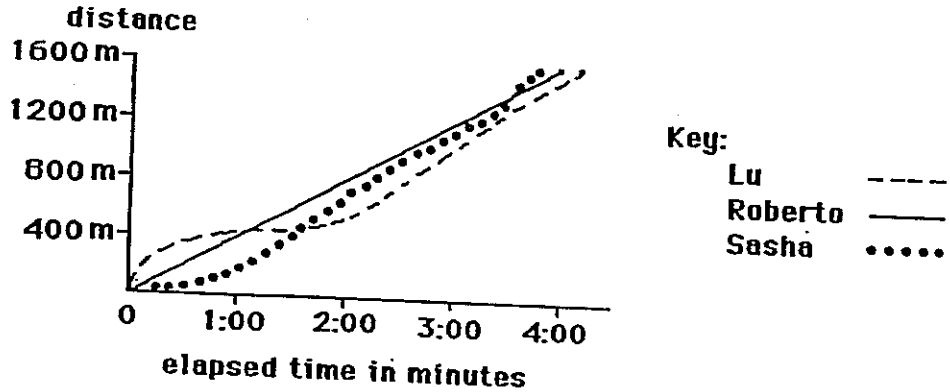
★★★★ 9. Lu, Roberto, and Sasha had a 1600-meter rollerblading race. A recording device was attached to each one. The graph of the race was plotted on the same axis system, as shown below.

a. What was the order in which they finished, 1st to 3rd? _____, _____, _____

b. Who started off the slowest? _____ The fastest? _____

c. At about what time after the race started did Sasha pass Lu? _____

d. Who raced at the same pace, all the way through? _____



SUNSHINE MATH - 7
Neptune, VII

Name: _____

(This shows my own thinking.)

★★★ 1. What common fraction is equivalent to $0.\overline{325}$?

Answer: _____

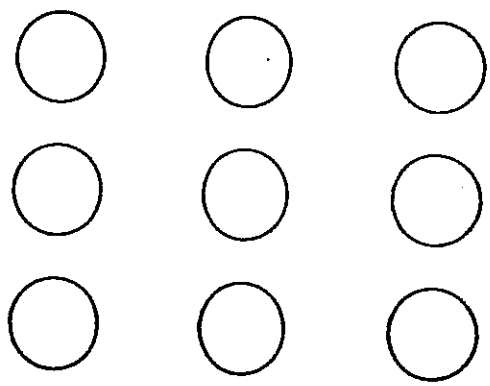
★ 2. What five consecutive odd numbers total 95?

Answer: _____

★★ 3. Lisa had some money. She gave half to her brother and spent half of what she had left. Then she lost 25¢ and only had 50¢ left. How much money did she have to begin with?

Answer: _____

★★★ 4. Arrange the digits one through nine in the circles in such a way that each row across and down has the same total.



★ 5. Find a year between 1970 and 1980 where the sum of the digits in the hundreds place and the thousands place equals the sum of the digits in the ones place and the tens place.

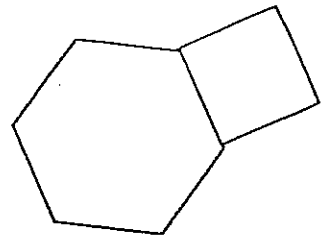
Answer: _____

★★ 6. Andy takes a 30 question test. How many questions can he miss and still make a 75%?

Answer: _____

★★★★ 7. If a regular hexagon shares a side with a square, and the perimeter of the hexagon is 72 cm, what is the area of the square?

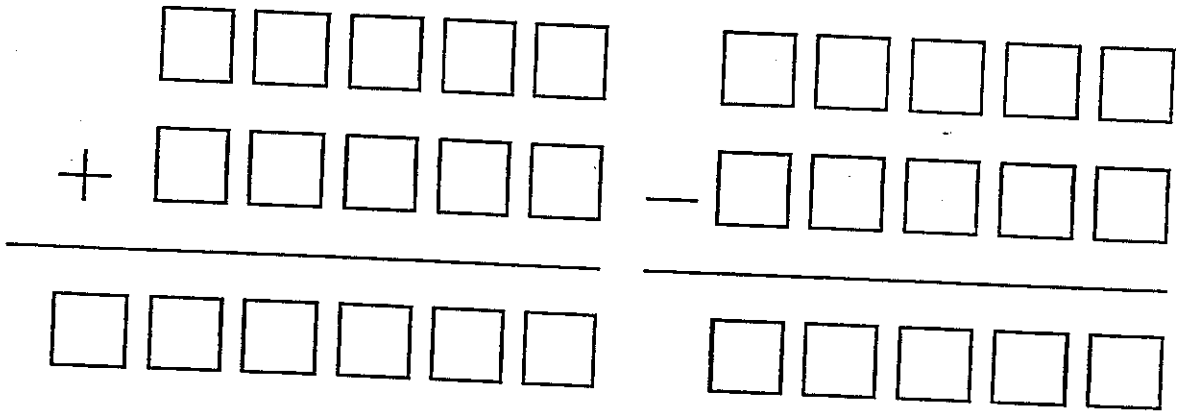
Answer: _____



★★★★ 8. Put the digits 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9 into each square, using each digit only once.

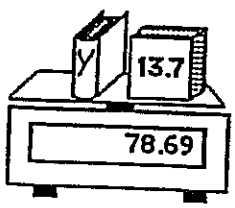
Make the *sum* of the 2 five-digit numbers as large as possible:

Make the *difference* the smallest possible positive integer:

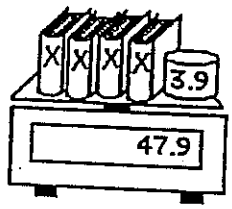


★★★ 9. Write and solve an equation to show each situation below.

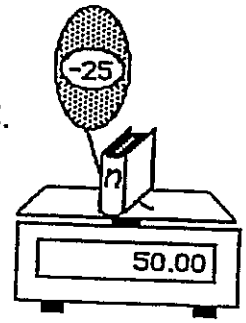
A.



B.



C.



Equation A: _____ Equation B: _____ Equation C: _____

solution: $y =$ _____ solution: $x =$ _____ solution: $n =$ _____

SUNSHINE MATH - 7
Neptune, VIII

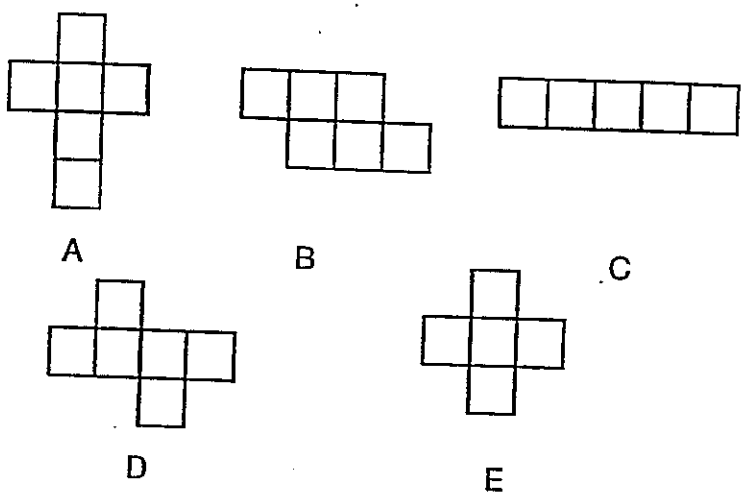
Name: _____

(This shows my own thinking.)

★★★ 1. On a farm there were 36 heads and 104 legs when counting the cows and chickens. How many chickens were on the farm? How many cows were on the farm?

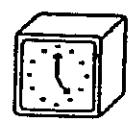
Answer: _____ chickens and _____ cows

★★ 2. Circle the figures that can be folded to make a closed cube.



★★★ **3. Give the exact number of degrees in the smaller angle formed by the hands of the clock at 5 o'clock. The picture is not accurate enough to be measured with a protractor.**

Answer: _____



★★★ 4. Your sock drawer has 10 blue socks, 16 red socks and 12 white socks.

a) In the dark, what is the probability that you will pull out a white sock?____

b) If you pull a white sock and put it on, what is the probability that the next sock you pull out will also be white? _____

★★ 5. Place the next three numbers in the pattern:

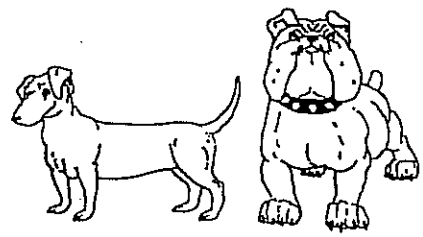
1, 3, 6, 10, 15, _____, _____, _____, ...

★★ 6. A student has the following grades on a math test: 65%, 90%, and 85%. What is the highest possible average the student can receive if there will be one more test, and all four tests count equally?

Answer: _____

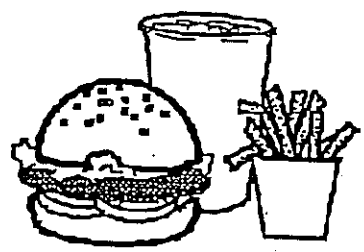
★★★ 7. If it takes 2 dogs 2 minutes to eat 4 bones, how long will it take 4 dogs to eat 24 bones?

Answer: _____



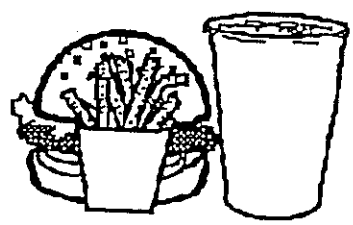
★★ 8. Insert parentheses to make the sentence true: **28 - 20 - 3 - 4 = 7**

★★★ 9. Walter saw this view of his hamburger, fries, and cola when he looked straight at the counter. Tell which view each of the pictures below show, the view from the right, from the left, or the view from the back of the counter. Write "right," "left," or "back" in the correct blank.



_____

_____



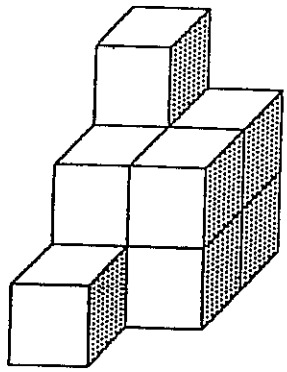
_____

SUNSHINE MATH - 7
Neptune, IX

Name: _____

(This shows my own thinking.)

★ 1. How many cubes were glued together to create this solid figure?



Answer: _____

★★★ 2. A CD costs $14.76, including tax. You give the clerk a twenty dollar bill and a penny.

a) Why would you give the clerk the extra penny?

Answer: _____

b) How much change will you receive?

Answer: _____

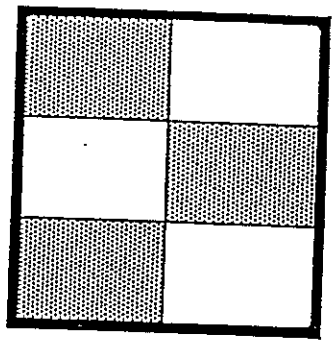
★★ 3. **Estimate a 15% tip for a $15.32 restaurant bill. About how much money should you leave as a tip?**

Answer: _____

★★★ 4. Mary calls every three days, Nicole calls every 4 days and Cindy calls every 6 days.

Once in every _____ days, all three will call on the same day.

★ 5. What percent of the rectangle is shaded?

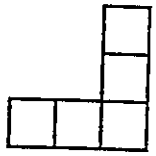


Answer: _____

★★ 6. Estimate to the nearest half hour the time it will take to travel 870 miles at an average speed of 50 miles per hour.

Answer: _____

★★★ 7. The figure below consists of 5 squares of the same size. The area of the figure is 180 square units. What is the perimeter?



Answer: _____

★★★★ 8. You've heard "Two wrongs don't make a right." But in the puzzle below, two wrongs do make a right! Solve the puzzle by finding the values of the letters W, R, N, G, T, and I.

```
  W R O N G
+ W R O N G
-----------
  R I G H T
```

Letter O = 0 (zero)
Letter H = 8

W = __ R = __ N = __ G = __ T = __ I = __

SUNSHINE MATH - 7
Neptune, X

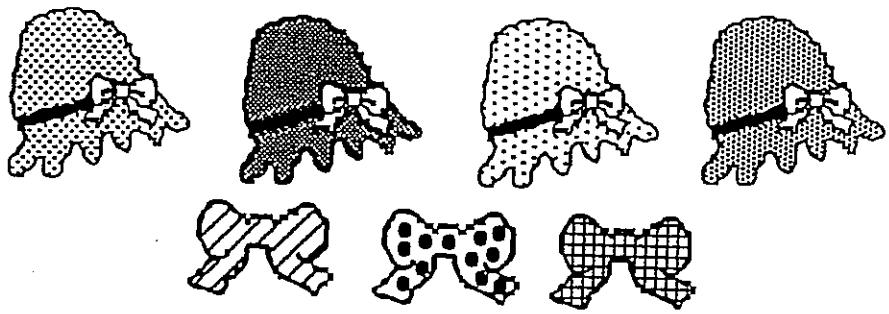
Name: _____

(This shows my own thinking.)

★★ 1. At Super Star Middle School, sixty of eighty teachers are female. What percent of the teachers are male?

Answer: _____%

★★★ 2. Aurelia has 4 hats; one green, one yellow, one blue and one purple. She has 3 pretty bows for them; one with stripes, one with polka-dots and one with checks. If she must use one bow per hat, how many different hats can she possibly make, assuming she can put any bow on any hat and change them whenever she chooses?



Answer: _____hats

★★ 3. Sam wants to have a Halloween party for 30 of his friends. Jumbo subs cost $15.99 and can feed 8 people. How much will Sam spend to feed himself and thirty friends, after sales tax of 7% is added?

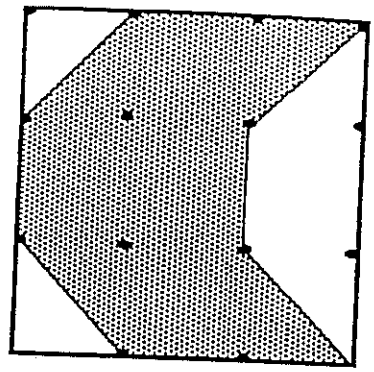
Answer: $_____

★★★ 4. In her first 20 free-throw attempts, Suzie sunk 9 baskets. How many baskets must she sink in her next 30 attempts to have an overall average of 70%?

Answer: _____ baskets

★★★★ 5. The area of the large square made on a wooden geoboard is 81 sq. in. What is the area of the shaded portion?

Answer: _____ sq. in.

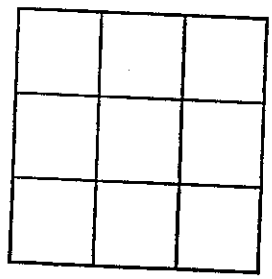


★★★ 6. How many terms does the following arithmetic sequence have?

$$2.5, 4, 5.5, 7, \ldots\ldots\ldots\ldots\ldots\ldots, 17.5$$

Answer: _____

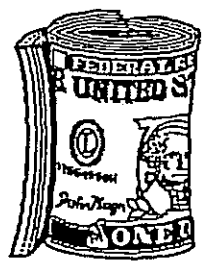
★★ 7. How many squares are shown in the picture below?



Answer: _____ squares

★ 8. Miguel's family wants to go to Disney World. Admission is $38.00 each. His dad has saved $75.00. How much more does he need to save for Miguel, his dad, his mother and his sister to go to Disney World?

Answer: $_____

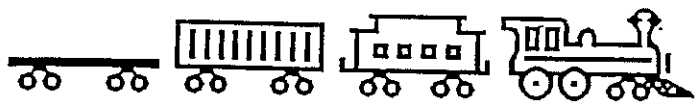


SUNSHINE MATH - 7
Neptune, XI

Name: _____

(This shows my own thinking.)

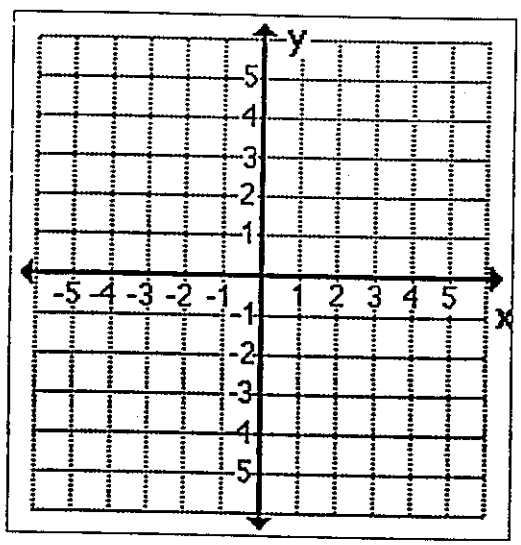
★★ 1. If a train has 1 engine and 3 other cars, and the engine must always be in front, how many different ways can the 4 cars in the train be arranged?



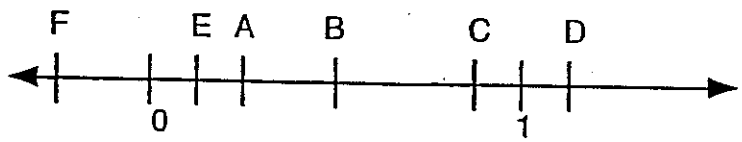
Answer: _____

★ 2. Plot these points on the grid below and connect them in order. You should get a familiar picture.

a. (-3,0)	b. (-1,-1)	c. (-2,-4)	d. (0,-2)
e. (2,-4)	f. (1,-1)	g. (3,0)	h. (1,0)
i. (0,3)	j. (-1,0)	k. (-3,0)	



★★★★ 3. If point A is multiplied by point B the answer will be point _____.



★★★ 4. Mike's birthday was 100 days ago. Today is Wednesday. On what day of the week did his birthday fall?

Answer: _____

★★★★ 5. David signed a contract that says he must build 10 dog houses for the S.P.C.A. The organization wants them ready within one month. For every dog house David completes he will receive $40 and for every one he fails to complete he will be fined $10. At the end of the month David received $150. How many dog houses did he build?

Answer: _____

★★★ 6. Mary starts a project at the library at 9:00 A.M. She estimates that her work will take her about 4 hours. She plans to take a 15 minute break and a 30 minute lunch. Her walk home is about 20 minutes. About what time would she expect to return home?

Answer: _____

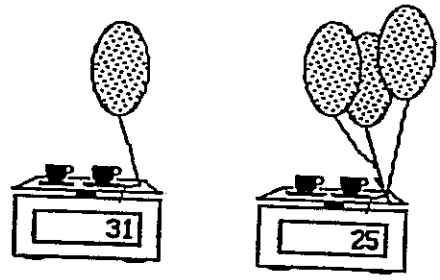
★★ 7. In 1977, Florida started keeping records on the number of manatees that died each year. The results through 1980 are shown below. What is the average number of manatees that died per year from 1977 to 1980? Round your answer to the nearest whole number.

YEAR	NUMBER DEAD
1977	112
1978	88
1979	80
1980	65

Answer: _____

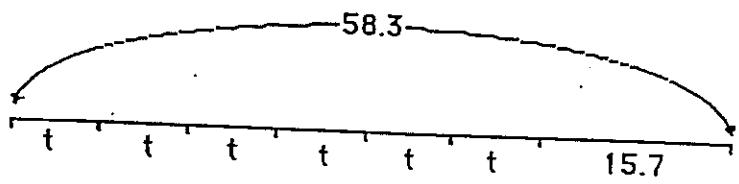
★★★ 8. The scale shows weight in grams. How much does each cup of coffee weigh? Remember that a balloon can have negative weight, if filled with helium.

Answer: _____ grams



★★★ 9. Write an equation for the situation below. Solve the equation by finding the value for t.

Answer: An equation is: _____. The solution is $t =$ ____



SUNSHINE MATH - 7
Neptune, XII

Name: _____

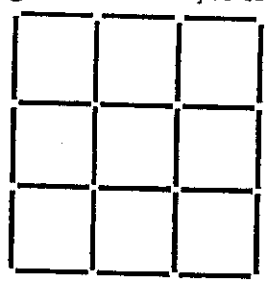
(This shows my own thinking.)

★★ 1. Using 4 fours with any operations or grouping symbols, write an expression that has a value of 9.

4 4 4 4

Answer: _____

★★ 2. This figure is made of 24 toothpicks arranged to form 9 small squares. Show how to remove 4 toothpicks, by putting an ✗ on them, to leave 5 small squares.



★★★ 3. Give an example of 4 different test scores whose median equals the mean.

Answer: _____

★ 4. **There are 5 students on the bowling team, 8 students on the track team and 4 students on the tennis team. The only students on more than one team are the two students on both the bowling and tennis teams. How many students are participating in these three sports?**

Answer: _____ people

★★ 5. **Before the big flag football game between 7th and 8th grade girls, the ten 7th graders on the team all shake hands with each other. How many handshakes are exchanged?**

Answer: _____

★★★ 6. A new lottery game has 8 scratch-off spots. The numbers from 1 through 8 have been randomly placed on the spots. To win, you have to scratch off 3 *even numbers* with only 3 scratches allowed. What are your chances of winning?

Answer: _____

★★★★ 7. To make money for the 7th grade end-of-year party, baked goods were to be sold. Herbert was assigned to correctly price the cookies. A small cookie was to sell for 25¢. A giant cookie, whose diameter was 4 times that of the small cookie, was also to be made. Herbert priced the giant cookie based on its area as compared to the area of the small cookie. How much did it sell for?

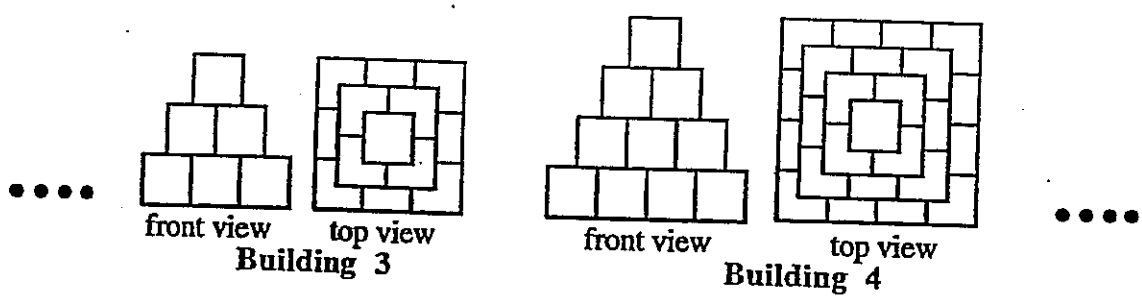
Answer: _____

★★★ 8. Shown below are the front view and top view of two buildings made according to a pattern.

a. How many blocks would it take to build the 5th building in the pattern? ____

b. How many blocks would it take to build the 10th building in the pattern? ____

c. If you had 1000 blocks, what the largest building number you could build? ____



★★ 9. How much larger is the sum of the even numbers from 1 to 100, than the odd numbers from 1 to 100?

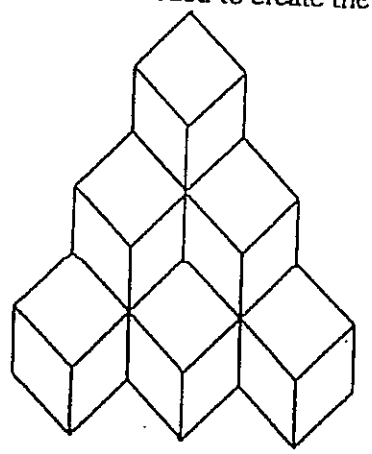
Answer: ____

SUNSHINE MATH - 7
Neptune, XIII

Name: _____

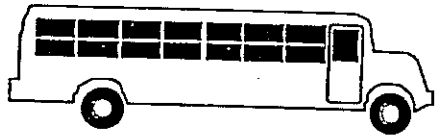
(This shows my own thinking.)

★ 1. How many cubes were needed to create the solid figure below?



Answer: _____cubes

★★★★ 2. One bus arrives at Mathematics Mall every 16 minutes, while another bus arrives every 20 minutes. If they both arrive at 3:00 P.M. what is the next time they will both arrive at the mall at the same time?



Answer: _____

★★★★ 3. A basketball team has players with the following heights:

6'1", 6'3", 6', 5'11"

If the average height of this 5-player team is 6'1", how tall is the fifth player?

Answer: ____ft. ____in.

★ 4. The sum of the ages of Amy and her sister is 19 and the difference is 5. What is the product of their ages?

Answer: _____

★ 5. A battery in a portable T.V. has an expected life of 1000 hours. If you watch such a T.V. every day from 4 P.M. until 10 P.M., about how many months can you expect your T.V. to play using the original battery?

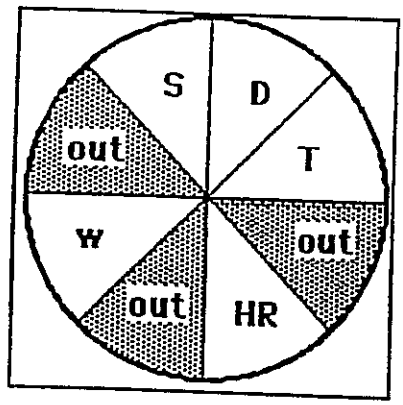
Answer: _____ months

★★★ 6. The estimated cost of sending a person to Mars is $45 billion. This amount is to be shared equally by the 250 million people in the United States. What is each person's share?

Answer: $_____ per person

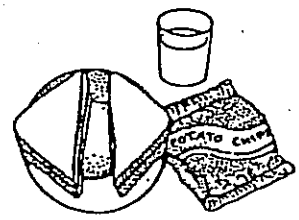
★★★ 7. Dante made a dart board "baseball game" for his house. As the batter, he would either get a walk (w), a single (s), a double (d) a triple (t), a homerun (hr), or make an out. If his darts land randomly on the board,

a. What percent of the time will he be successful in getting on base? (Hint: A home run is counted as getting on base) ____
b. What percent of the time will he make an out? _____
c. What is the chance that he will make 3 outs in a row? _____



★★ 8. Three out of every five students who eat lunch in the cafeteria have chocolate milk. How many students can you expect to drink chocolate milk if 250 students eat lunch in the cafeteria on Friday?

Answer: _____ students



SUNSHINE MATH - 7
Neptune, XIV

Name: _____

(This shows my own thinking.)

★★ 1. On the average, human beings breathe 980 times each hour. Assume you are average.

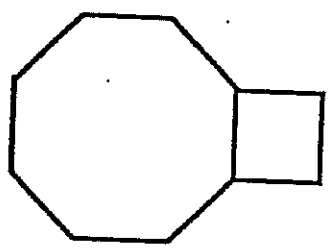
a. About how many breaths per week do you take? _____

b. About how long would it take you to breathe a million times? _____

★ 2. John has 20 dimes and 30 pennies. Ken has the same amount of money in nickels and quarters. If Ken has 8 quarters, how many nickels does he have?

Answer: _____nickels

★★ 3. If the perimeter of a regular octagon is 48 cm., what is the area of the adjacent square?



Answer: _____sq. cm.

★ 4. Mark and John drive to work together. They split the cost of parking in a parking garage. How much would each pay to park the car for 7 hours?

PARKING RATES	
FIRST HOUR	$4.00
EACH ADDITIONAL HOUR	$1.75

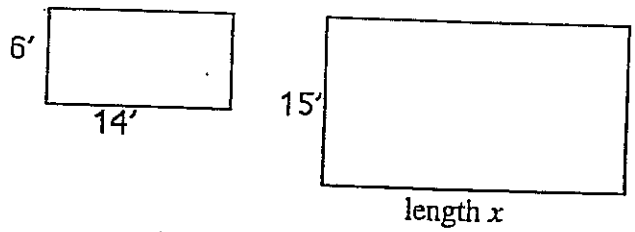
Answer: $_____

★★★★ 5. Mike has a jar filled with 100 jelly beans. Some are green and some are red. When he shook the jar and removed a handful of jelly beans, he got 10 green and 15 red. Using this information, estimate the number of green and red jelly beans in the jar.

Answer: _____ green

_____ red

★★★ 6. Two rectangles below are similar. Find the length x of rectangle B.

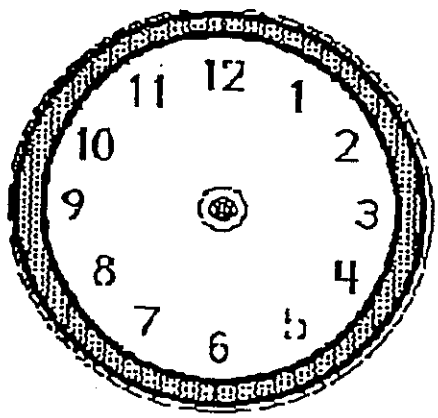


Answer: _____feet

★ 7. Sally traveled on an airplane to visit her cousin Sue. She overheard the flight attendant saying that there were 254 people on board, but the plane wasn't full. She noticed that each row seated 6 people. What is the minimum number of rows needed for the 254 passengers?

Answer: _____rows

★★★★ 8. From 3 P.M. today until 3 P.M. tomorrow, how many times will the hands on the clock coincide?



Answer: _____

SUNSHINE MATH - 7
Neptune, XV

Name: _____

(This shows my own thinking.)

★ 1. Jeremy started out with 7 pogs. In the first game he lost 2, then he won 4. He continued to play and lost 5, won 3, lost 1, won 2, then lost 1. How many more pogs did he have when he finished, than he started with?

Answer: _____ pogs

★★ 2. Mrs. Smith had a plaque engraved for the outstanding mathematics student. The engraving cost is 74¢ for the first eight letters and 10¢ for each additional letter.

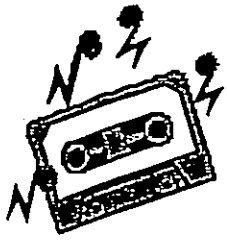
a. How many letters are in a name that has a total engraving cost of $1.84? _____

b. How much would your first and last name cost, on the plaque? _____

★★ 3. A hot-air balloon race started at 10:30 A.M. The timer started a stop watch and let it run for the entire match. When the race ended, the timer noted that 215 minutes had passed. What time did the race end?

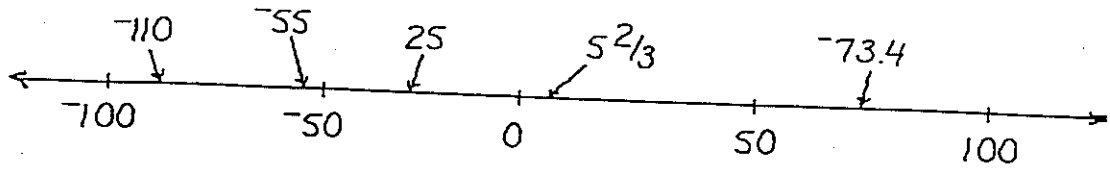
Answer: _____

★ 4. Four out of five cars in the United States have a tape player and a radio. What percent of American cars do *not* have a tape player or radio?

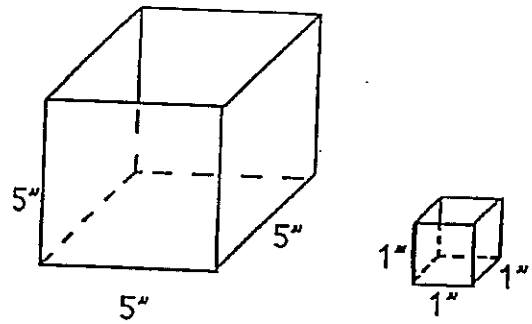


Answer: _____%

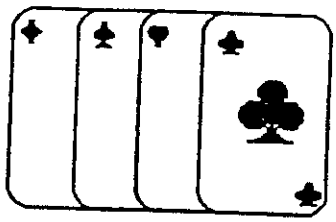
★★★ 5. The numbers below the line (-100, -50, 0, 50, and 100) are placed correctly. Three of the numbers above the line are incorrect, but two are about right. Circle the three that are incorrect.



★★★★ 6. How many small cubes will fit in the large cube? _____ cubes



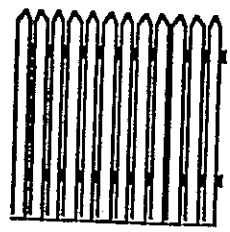
★★★★ 7. How many cards must be drawn from a standard deck to be certain that 4 cards of the same suit are drawn? Assume that the cards are not replaced each time.



Answer: _____cards

★★ 8. Jim and Rowena spent a total of 28 hours putting up a fence. Rowena worked 4 more hours than Jim. How many hours did each work?

Answer: Rowena: _____ hours
Jim: _____ hours



SUNSHINE MATH - 7
Neptune, XVI

Name: _____

(This shows my own thinking.)

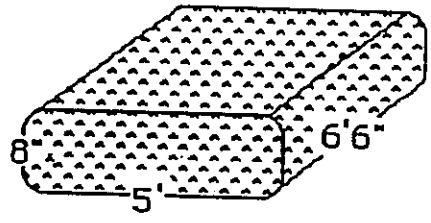
★ 1. West Side High School graduated with honors 23 boys and 24 girls. There were 210 students who graduated without honors. What percent of the graduation class were honor students?

Answer: _____%

★ 2. If sixty is divided by one half and added to ten, what is the result?

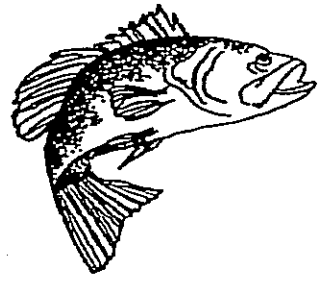
Answer: _____

★★★★ 3. A queen-size water bed mattress measures 5 feet wide by 6 feet 6 inches long by 8 inches thick. Water weighs about 62 pounds per cubic foot. To the nearest 50 pounds, how much does such a mattress weigh, when full of water?



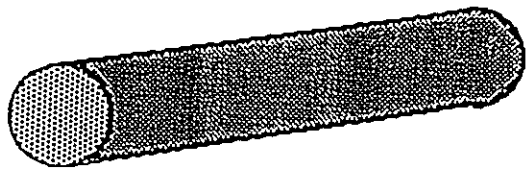
Answer: _____ pounds

★★★ 4. Bob Jones sometimes fishes at the pier. The gulf is 8 feet deep at the pier, but every quarter mile you move away from the pier, the gulf becomes 1 foot deeper. Sometimes Bob takes his boat out to go fishing. When he is 3.25 miles from the pier, how deep is the water?



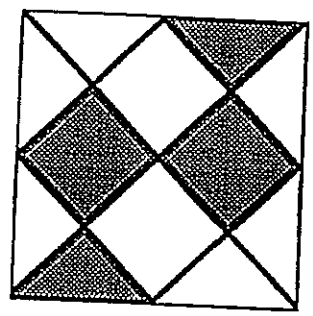
Answer: _____ feet deep

★★ 5. If it takes $5\frac{1}{4}$ minutes to make one cut through a log, how long will it take to cut a five foot log into 5 equal lengths?



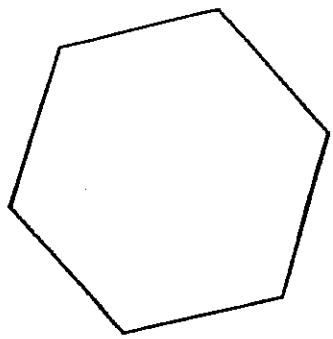
Answer: _____ minutes

★★ 6. The picture to the right is composed of squares and isosceles triangles. What percentage of the picture is shaded?



Answer: _____%

★★★ 7. Change this regular hexagon so that it looks like a cube by drawing only 3 additional line segments.



★★★★ 8. A candy bar weighs 4 ounces. If you eat only half of the remaining candy bar with each bite, how many bites have you taken when there is exactly 0.125 ounces left.

Answer: _____ bites

SUNSHINE MATH - 7
Neptune, XVII

Name: _____

(This shows my own thinking.)

★★★★ 1. At a drive-in movie there is a fixed charge for the driver and one passenger and an extra charge for each additional passenger. If 6 people are in the car, the total charge is $8.00. If 3 people are in the car, the total charge is $4.25. What is the fixed charge for the driver and one passenger?

Answer: $ _____

★★★ 2. The owner of a computer company works 7 days a week during the summer when business is booming. He wears a clean shirt to work every day. If he drops off his shirts and picks up the previous week's shirts every Monday after work, how many shirts must he own so that he doesn't run out of clean clothing?

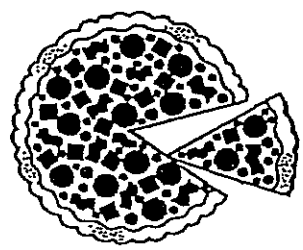
Answer: _____

★ 3. Juanita and her family leave home for a vacation at 6:00 A.M. During the day, they stop 3 times to eat for an hour each time, and 4 times for gas and a restroom break for 30 minutes each time. They drive a total of 600 miles and arrive at 9:00 P.M. What is their average rate of speed while the car is moving?

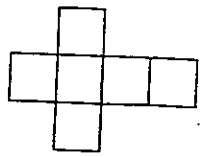
Answer: _____miles per hour

★★ 4. A pizza restaurant offers three choices of cheese, two choices for crust, and four choices for toppings. How many different pizzas can be made using exactly one choice of cheese, crust and topping?

Answer: _____different pizzas

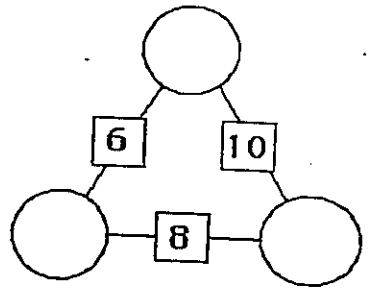


★★★★ 5. The figure to the left consists of 6 squares the same size. The area of the figure is 294 square units. When folded, it makes a box as shown to the right. What is the volume of the box?



Answer: _____ cubic units

★★★ 6. Find numbers for the vertices so that the numbers on the sides are the sum of vertices they join. Write each answer in the appropriate circle.



★★. 7. A five digit zip cope has two identical missing digits x so that it reads: $69x4x$

How many zip codes are possible if the zip code is divisible by 7?

Answer: _____ zip codes

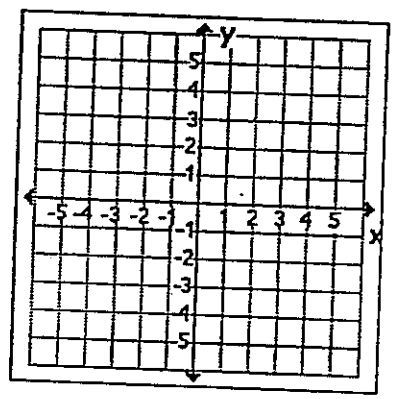
★★★ 8. The average of 4 positive whole numbers is 8. If all four numbers are less than 10, what are the five possible sets of numbers?

Answer: _____, _____, _____, _____, _____

★★★★ 9. Connect these points with a heavy line:

(a) connect (-5, -1) to (-5, -6)
(b) connect (-5, -3) to (-3, -3)
(c) connect (-3, -6) to (-3, -1)
(d) connect (1, -2) to (1, -6)
(e) connect (0,-1) to (-1,-6) to (-2,-1)
(f) connect (-1.5, -3) to (-0.5, -3)
(g) draw a big dot at (1, -1)

Draw the reflection of these lines about the x axis. You should now have a familiar word.



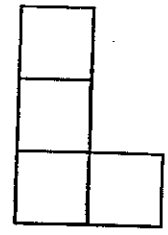
SUNSHINE MATH - 7
Neptune, XVIII

Name: _____

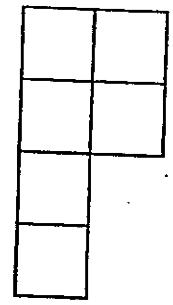
(This shows my own thinking.)

★★★★ 1. Three "landscape views" of a building made from cubes are shown below. How many cubes were used to make the building? Make such a building if it helps you.

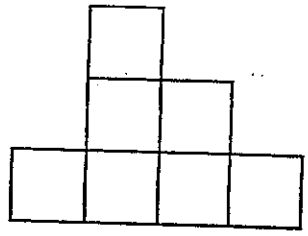
Answer: _____ cubes



Front view



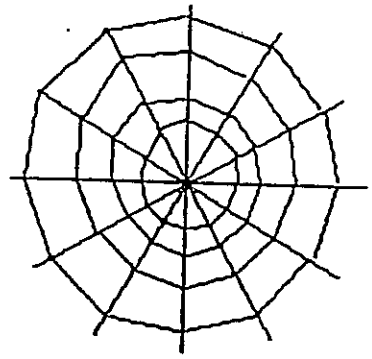
Top-down view



View from the right side

★★ 2. A spider made the web shown. How many degrees are in each *central angle* of this web? Note that somehow the spider knows to make all the central angles congruent.

Answer: _____ °



★★ 3. The length of each side of the military's pentagon building in Washington, DC, is a whole number of feet. Circle the number below which the perimeter could not be, if this is a *regular* pentagon:

a) 1990 feet

b) 1415 feet

c) 2900 feet

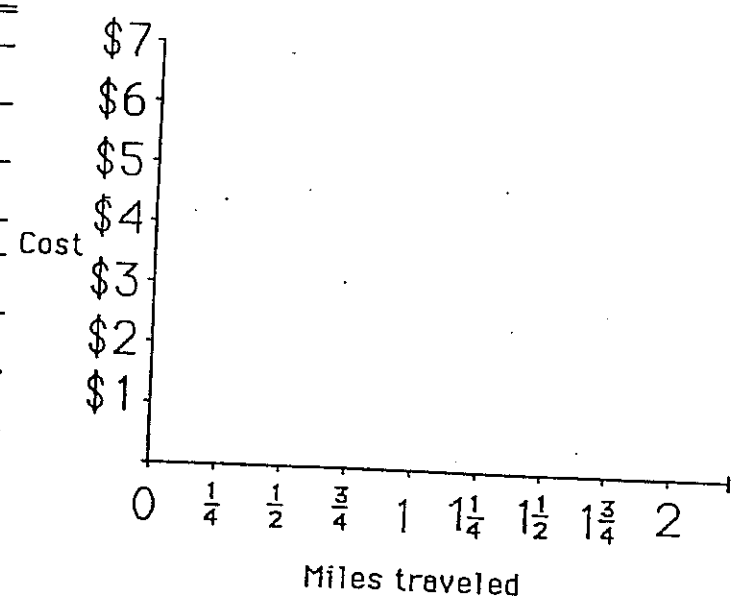
d) 2748 feet

★ 4. You bought 12 tickets to a raffle and your sister bought 4. If 100 tickets were sold, what is the probability that you or your sister will win the raffle?

Answer: _____

★★★★ 5. Green Cabs charge $1.40 for the first quarter mile and $0.65 for each additional quarter mile. Yellow Cabs charge $1.00 for the first half mile then a flat rate of $1.00 for each additional quarter mile. Fill out the chart below to find the cost for each company for a few miles. Graph the rates for both companies. Then answer the questions below the graph.

Cost of:	Green Cab	Yellow Cab
$\frac{1}{4}$ mile		
$\frac{1}{2}$ mile		
$\frac{3}{4}$ mile		
1 mile		
$1\frac{1}{4}$ mile		
$1\frac{1}{2}$ mile		
$1\frac{3}{4}$ mile		
2 miles		



a. For what trip length are the Green and Yellow Cab fares the same? _____
b. What happens on the graph when the fares are the same for both?
_____

★★★ 6. Attendance at Busch Gardens is down. To increase the daily attendance, the daily admission price of $30 is reduced by 20%. The plan works and attendance increases, but now the park is overcrowded. To reduce the number of people, the admission price is now raised 20%. How does the new price compare to the original price?

Answer: _____

★★★ 7. An English teacher was asked how many fish she caught. She replied:

When I tried to place a fish upon each dish, I had a fish without a dish.
When I tried to place two fish upon each dish, I had a dish without a fish.
You'll never hear boos and hisses, if you can find how many fishes!

How many did she catch? _____

SUNSHINE MATH - 7
Neptune, XIX

Name: _____

(This shows my own thinking.)

★★ 1. Which whole number values make this inequality true? Circle your choice.

$$\frac{X}{2} < 10$$

a) $X = 19, 20,$ or 21

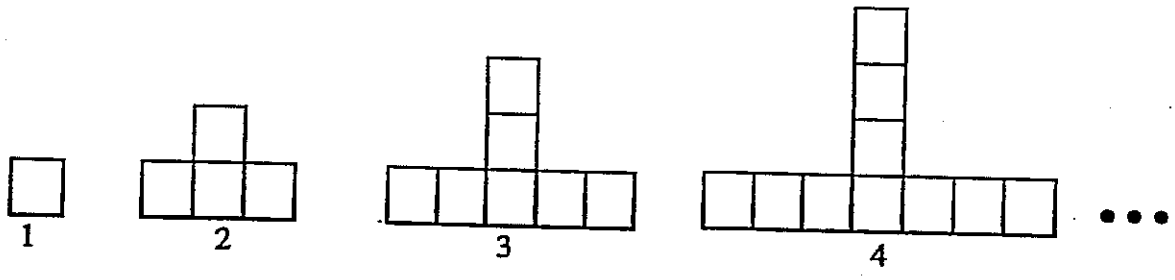
b) $X = 41, 42, 43$

c) $X = 0, 1, 2, \ldots, 19$

d) $X = 21, 22, 23, \ldots$

★★★★ 2. The figures below form a pattern of squares. The *area* of the 1st figure is $\frac{1}{16}$ inch^2.

a. What is the *perimeter* of the 1st figure? ____ inch
b. What is the *area* of the 3rd figure? ____ inch^2
c. What is the *perimeter* of the 3rd figure? ____ inches
d. What is the *area* of the 10th figure in the pattern? ____ inches^2



★★★ 3. The scale on a map is: *1 inch = 16 miles.* A National Park is represented on this map by a square whose side is 1/8 inch. What is the actual area of the park in square miles.

Answer: _____ sq. mi.

★★ 4. If $X + 2 = Y$ and $Y + 1 = 5$, then $X =$ _____.

Answer: _____

★★★ 5. If $280 = N$, then $350 =$ _____.

a) $\frac{N}{4}$

b) $\frac{4N}{5}$

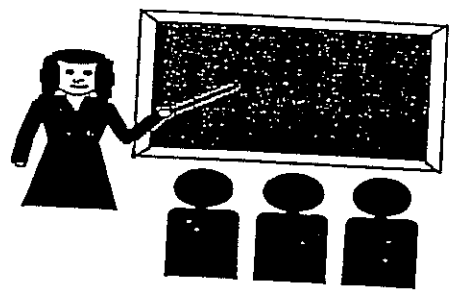
c) $\frac{4N}{3}$

d) $\frac{5N}{4}$

Answer: _____

★★ 6. In a class of 30, 12 are boys. If 6 more boys join the class, what percent of the class is then boys?

Answer: ____ %

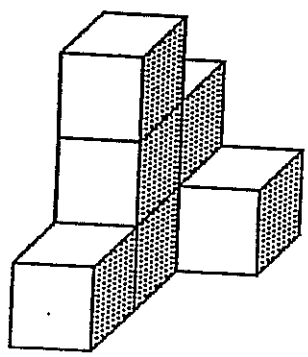


★★★ 7. In the correct addition shown below, A, B, and C are different non-zero digits.. What is the value of C?

$$\begin{array}{r} B\ B \\ +\ B\ B \\ \hline A\ B\ C \end{array}$$

Answer: _____

★★★ 8. The figure below is made by glueing together 7 cubes.. If the figure is dipped in a bucket of red paint and allowed to dry, how many square faces will have paint on them?



Answer: _____

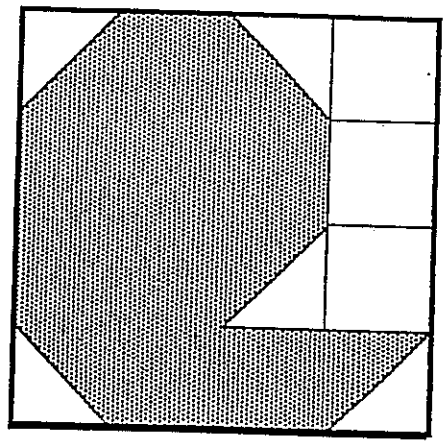
SUNSHINE MATH - 7
Neptune, XX

Name: _____

(This shows my own thinking.)

★★ 1. The city is planning a new park. Each small square is 1 acre. The shaded portion is set aside for softball diamonds, soccer and football fields, and basketball courts. How many acres of the park will be for these sports?

Answer: _____ acres



★ 2. Hector randomly picks an integer between 0 and 9. Which one of the following is the most likely outcome? Circle your choice.

a) the number is 5
b) the number is 9
c) the number is odd
d) the number is not 1

★★★★ 3. Write the correct letter from the choices below, to complete the sentence truthfully.

The difference between two prime numbers can never equal _____.

a) 1
b) 2
c) 7
d) 8

★★★ 4. Lin's scores on her math tests this period were: 88, 92, 88, 75, 95, 90. Her teacher said she could have her choice of the mean, median, or mode of these scores as her final grade. Which should she pick?

Answer: _____

★★ 5. The first term in a sequence (pattern) is 7. Each term in the sequence is 4 more than 2 times the number before. What are the second and third terms in the sequence?

Answer: _____, _____

★★ 6. Under the plates, there are 4 coins in a row: a penny, a nickel, a dime and a quarter. The penny is not next to the dime. The nickel is second (from the left) in the row. The quarter is to the left of the dime. Write which coin is under each plate in order from left to right?

Answer: _____ _____ _____ _____

★★★ 7. Baseball cards can be ordered in packages of 8, 64, 512 and so on. If the package sizes continue to increase at the same rate, what is the size for the next larger package?

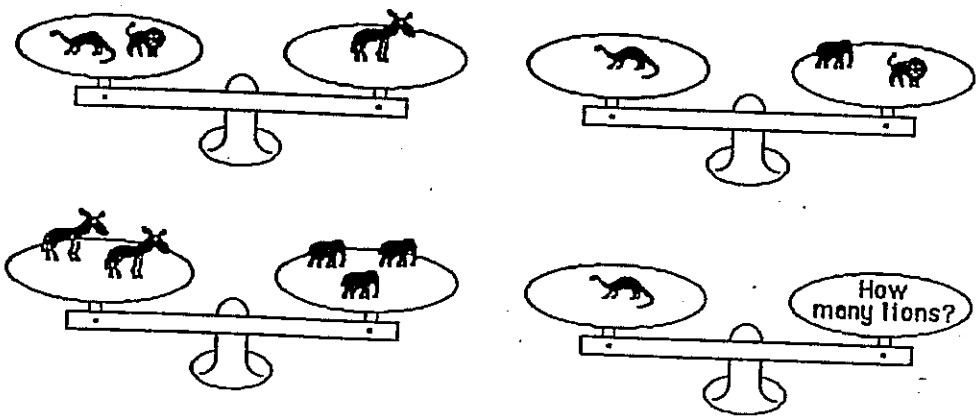
Answer: _____

★ 8. Find the missing number: $\frac{2}{6} + \frac{2}{6} + \frac{2}{6} + \frac{2}{6} = \frac{??}{24}$

Answer: _____

★★★ 9. A dinosaur and a lion balance a burro. A dinosaur balances an elephant and a lion, and 2 burros balance three elephants. How many lions balance a dinosaur?

Answer: ____



SUNSHINE MATH - 7
Neptune, XXI

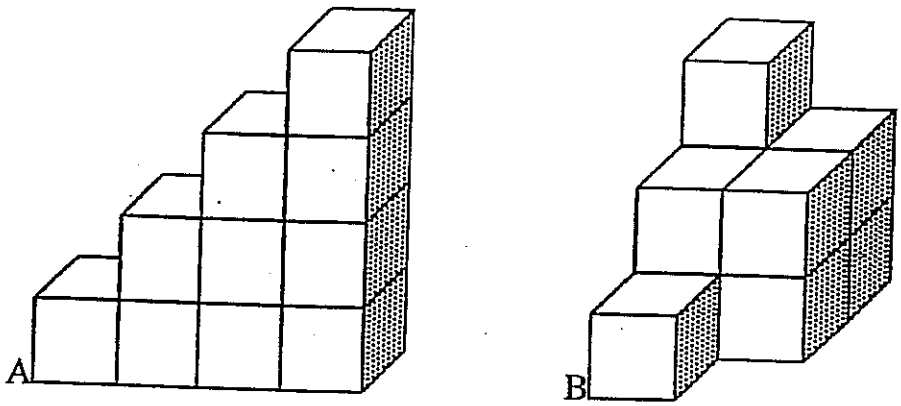
Name: _____

(This shows my own thinking.)

★★ 1. Suzie entered an elevator in a tall building. She rode up three floors, down 5 floors, up 7 floors and then down 9 floors. She found herself on the 23rd floor. On what floor did she enter the elevator?

Answer: _____

★★★★ 2. The following figures are both made from 10 cubes and so have the same volume. If you had to paint the **outside surfaces** of the cubes, including the bottom surface, which figure would require more paint?



Answer: _____

★ 3. **A number x is divided by 6 and then 3 is subtracted from the result to give 4. What is the original number x?**

Answer: $x =$ _____

★ 4. **Fill in the blank from the choices given to make the sentence true:**

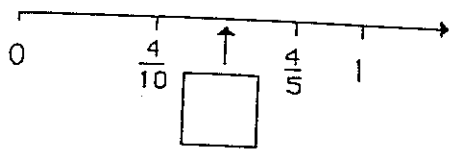
If the length of each side of a square is a whole number, the perimeter of the square could not be ____.

a) 96 c) 300

b) 152 d) 462

★★ 5. The supplement of an obtuse angle is always a(an) _____ angle.

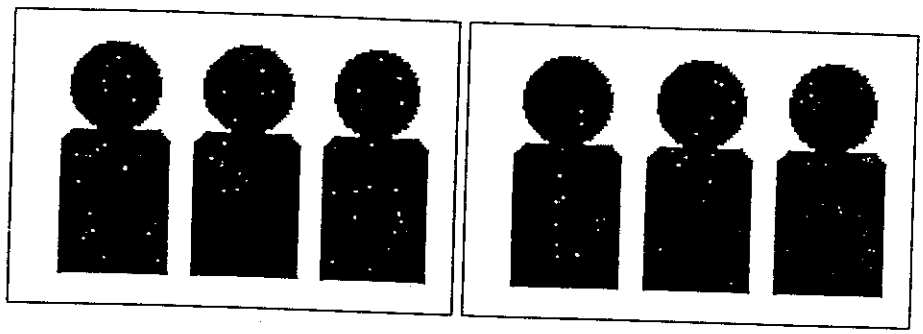
★★★ 6. The two points $\frac{4}{10}$ and $\frac{4}{5}$ are shown on the number line. Label the mid-point between them as a fraction in lowest terms.



★★★ 7. How many 2-inch square tiles are needed to make a square design that is 14 inches on each side, if there are no spaces between tiles?

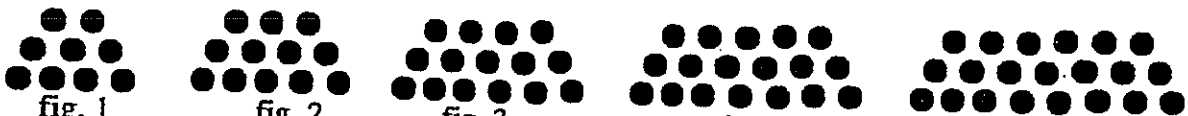
Answer: _____

★★★★ 8. John has 4 more brothers than sisters. How many more brothers than sisters does his sister Mary have?



Answer: _____

★★★★ 9. Consider the pattern of figures below.



(a) How many dots are needed to make figure 6? ____
(b) How many dots are needed to make figure 7? ____
(c) How many dots are needed to make figure 100? ____
(d) How many dots are needed to make figure n for any number n? _____

SUNSHINE MATH - 7
Neptune, XXII

Name: _____

(This shows my own thinking.)

★★ 1. The first four skating judges gave Mario & Maria a 4.2, 4.3, 4.6 and 5.0. What did the fifth judge give Mario & Maria if their average score from five judges was 4.6?

Answer: _____

★★ 2. Which group is ordered from least to greatest? Use your number sense!

a) $\frac{7}{3}, \frac{5}{2}, \frac{19}{10}$

b) $\frac{4}{9}, \frac{4}{8}, \frac{4}{7}$

c) $\frac{2}{6}, \frac{2}{8}, \frac{2}{10}$

d) $\frac{3}{5}, \frac{4}{8}, \frac{5}{9}$

Answer: _____

★★★★ 3. Cathy walks 1 mile in 20 minutes. She runs 1 mile in 10 minutes. At a recent 2-hour practice, to warm up and cool down Cathy walked for one-fourth of the 2 hours; she ran for three-fourths of the 2 hours. How many miles did Cathy travel in the practice session?

Answer: _____

★ 4. If 10% of 10% of a certain number x is 2, then x is:

Answer: _____

★★★★ 5. Of 20 students in class, 15 have brown hair, 16 have brown eyes, and 12 have both brown hair and brown eyes. How many students have neither brown hair nor brown eyes?

Answer: _____

★★ 6. Draw the next two figures in the pattern below:

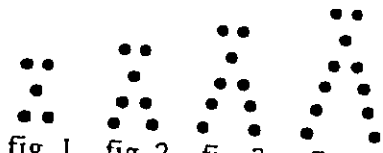
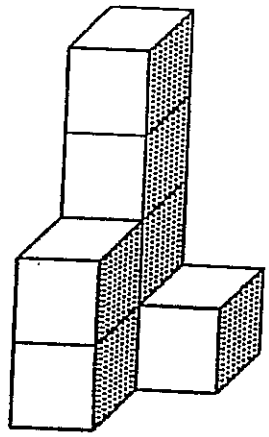


fig. 1 fig. 2 fig. 3 fig. 4 fig. 5 fig. 6

★★★ 7. (a) How many dots would it take to make figure 10 in the pattern above?_____

(b) How many dots would it take to make figure *n* in the pattern above?_____

★★★★ 8. This figure is made from seven cubes glued together. If the figure was dipped into paint, removed, then separated into cubes, how many square faces would not be painted?



Answer: _____

★ 9. In an airplane, 6 seats are placed in each row. What is the minimum number of 6-seat rows needed to seat 170 people?

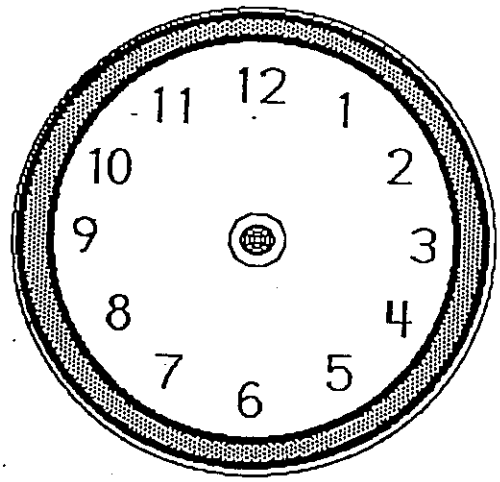
Answer: _____

SUNSHINE MATH - 7
Neptune, XXIII

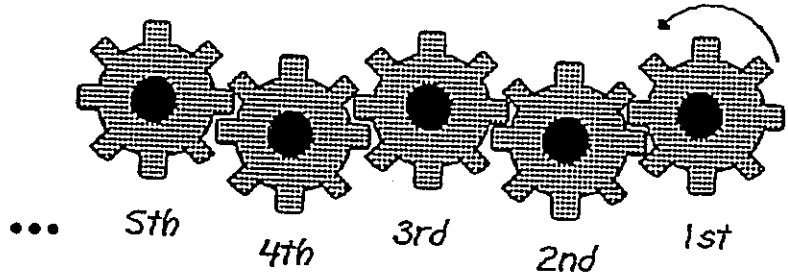
Name: _____

(This shows my own thinking.)

★★ 1. Draw hands on the clock to show 200 minutes before 2:00 P.M.



★★★★ 2. Think of how the 5 gears below would turn each other—clockwise or counterclockwise—before answering the questions. The 1st gear turns counterclockwise.



a. In what direction would the 2nd gear turn? _____

b. In what direction would the 3rd gear turn? _____

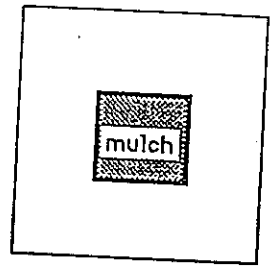
c. In what direction would the 4th gear turn? _____

d. In what direction would the 10th gear turn? _____

★★ 3. A school offers 2 foreign languages, French and Spanish; 2 computer classes, Logo and BASIC; and 3 physical education classes, volleyball, swimming, and archery. How many different student schedules can be made using exactly one of each of these types of classes?

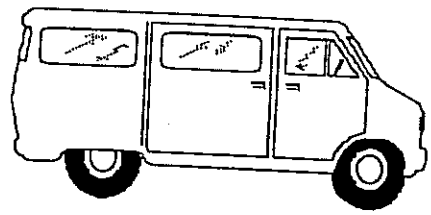
Answer: _____

★★★★ 4. A man has a 10 meter by 10 meter square garden. In the center is a 4 meter by 4 meter square patch he will use as a mulch pile. He uses the remainder for growing carrots, tomatoes, cucumbers and celery. Show in the drawing how to divide the growing land into 4 congruent rectangles, and tell what length and width each will be.



Answer: The length of each rectangle is ___ m and the width is ____ m.

★★ 5. What must be the rate in miles per hour of a truck, if it wants to make a 20 mile trip in 40 minutes?

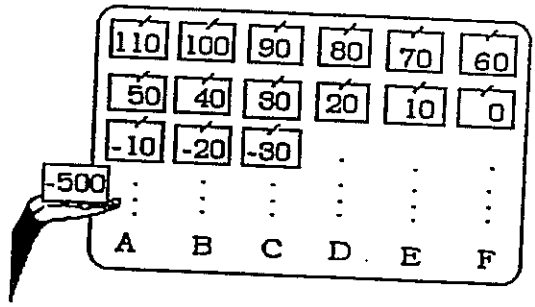


Answer: _____

★ 6. If $X = 6 + 4 + 3 + 1 + \frac{1}{2}X$, then X must equal:

Answer: $X =$ _____

★★★ 7. In which column should -500 go on this chart?

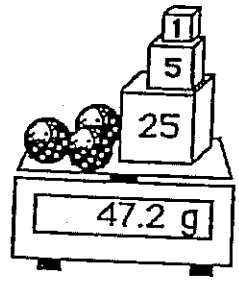


Answer: _____

★★★★ 8. Write and solve an equation to find the weight of 1 ball b.

Answer: An equation is: _____

The solution is: $b =$ _____



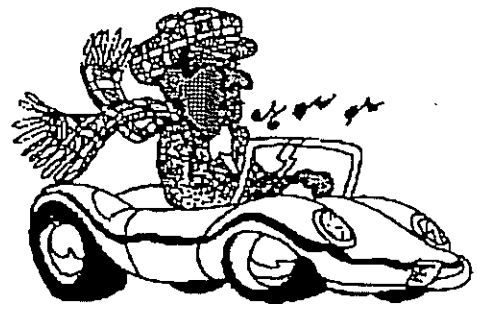
SUNSHINE MATH - 7
Neptune, XXIV

Name: _____

(This shows my own thinking.)

★★★★ 1. Bill bought a new Corvette in 1996 for $42,000. If the car decreases in value 10% each year, in what year will the Corvette be worth less than half of what Bill paid?

Answer: _____



★★★★ 2. For a science experiment, Denise was asked to take 170 apples that each weighed the same, and put them in paper bags to make the greatest possible number of bags of different weights. What is the greatest number of bags that Denise can use to hold the apples, if each bag must contain at least one apple, but no two bags may contain the same number of apples?

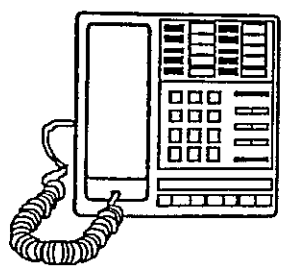
Answer: _____bags

★★★ 3. The tortoise and the hare had a 3000 meter race. They started at the same time. The hare hops at an average rate of 9 meters per minute while the tortoise averages only 1.5 meters per minute. After one hour, how many meters was the hare ahead of the tortoise?

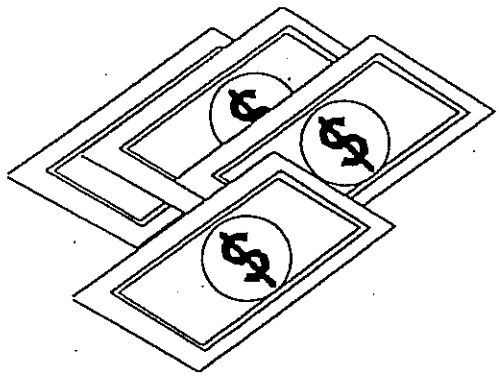
Answer: _____ m

★ 4. Al calls me every 3 days, Bob calls me every 4 days and Chris calls me every 6 days. Once in every _____ days all three will call on the same day.

Answer: _____



★★ 5. The Mason family went to an amusement park. They spent exactly $56.00 for tickets. The tickets cost $12 for each adult and $5 for each child. How many adults and how many children went to the park?



Answer: _____ adults

Answer: _____ children

★★ 6. Using 4 fours with any operations or grouping symbols, write an expression that has a value of 3.

4 4 4 4

Answer: _____

★ 7. Grades can range from 0 to 100 on a test. If you already have tests with scores of 92% and 84%, what is the lowest possible average you can have for three tests? Round to the nearest whole number.

Answer: _____ %

★★ 8. A standard deck of 52 cards is shuffled and then put in a box. What is the probability that, if a card is drawn randomly from the box, it will have a number on it of which 4 is a factor?

Answer: _____

SUNSHINE MATH - 7
Neptune, XXV

Name: _____

(This shows my own thinking.)

★ 1. If you already have scores of 83%, 91% and 86% on your first three math tests, what could your highest possible average be after 4 tests? (Assume no extra credit.)

Answer: _____%

★★ 2. Using 4 fours with any operations or grouping symbols, write an expression that has a value of 5.

4 4 4 4

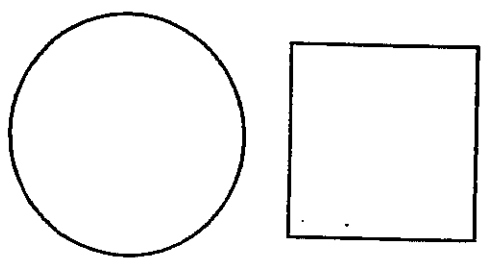
Answer: _____

★ 3. Figure out a rule which was used to determine which letters go above the line and which letters go below the line. Use that rule to place the rest of the letters correctly.

A EF HI KLMN

BCD G J O

★★★★ 4. The perimeter of a square is equal to the circumference of a circle.



If the diameter of the circle is 8, what is the area of the square?

Answer: _____ sq. units

★★★★ 5. This is the same pattern looked at 2 different ways. Write the next term in the pattern. Find two ways to describe how to find each new term.

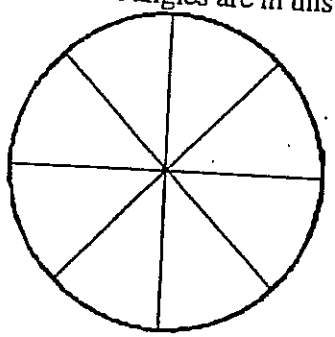
4, 7, 13, 25, 49, ____, . . .

One way to describe the next term is:_____

4, 7, 13, 25, 49, ____, . . .

Another way is:_____

★★★★ 6. How many acute central angles are in this figure? Right angles? Obtuse angles?



Answer: _____ acute angles

Answer: _____ right angles

Answer: _____ obtuse angles

★★★ 7. Your heart beats approximately 70 times a minute. The life span expectancy of a male is 75 years, and that of a female is 79 years. To the nearest billion, how many times will your heart beat if you live to your life expectancy?

Answer: _____ beats

★★★★ 8. Cookies were missing from the kitchen. They were taken by Sam, Bob, or Sue. Each made a statement to their mother.

Sam said: Bob took the cookies
Bob said: That is true.
Sue said: I did not take the cookies.

If at least one of them lied and at least one told the truth, who took the cookies?

Answer: _____

SUNSHINE MATH - 7
Neptune, XXVI

Name: _____

This shows my own thinking.)

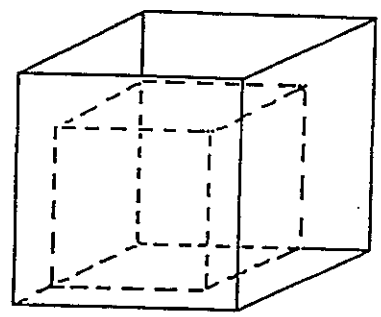
★★ 1. Using 4 fours with any operations or grouping symbols, write an expression that has a value of 6.

4 4 4 4 = 6

Answer: _____

★★★ 2. If a cube whose edge is 4 inches is placed inside of a cube whose edge is 5 inches, what percent of the space inside the larger cube is filled by the smaller cube?

Answer: ____ %



★★ 3. A baseball team won 6 out of 12 games and then won the next 6 games. What percent of their games did they win?

Answer: _____%

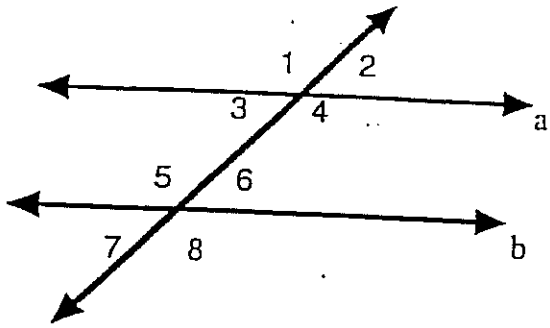
★★ 4. On the school track, four laps make a mile. Mark ran 6 laps in 12 minutes. At this rate how long would it take him to run a mile?

Answer: _____ minutes

★ 5. If a quart of ice cream is split equally among 4 people, what fraction of a gallon will each person get?

Answer: _____ of a gallon

★★★ 6. In the diagram below, lines a and b are parallel. If angle 1 measures 120° find the measures of angles 2, 3, 4, 5, 6, 7, & 8. Record them in the chart below.



Angle	Measure	Angle	Measure

★★★★ 7. On a TV game show there are 3 doors. The grand prize is behind one of them. If you appear on the show for 2 days in a row, what is the probability that you will pick the door with the grand prize both days?

Answer: _____

★★★ 8. Human hair grows at an average rate of 2.5 millimeters per week. Suppose that today is your 13th birthday and you have not cut your hair since you were born. Estimate how long your hair would be in meters today.

Answer: _____meters

★★★★ 9. Someone once asked Marilyn vos Savant, who is the smartest person in the world, this question:

> *Suppose the earth were smooth, and you could wrap a 25,000-mile-long metal belt snugly around it. Now let's say you lengthen the band by 10 feet, loosening it just a little. What would be the largest thing that could slither under the new band? An amoeba, a worm, a snake, or an alligator?*

What was her answer?

Answer: _____

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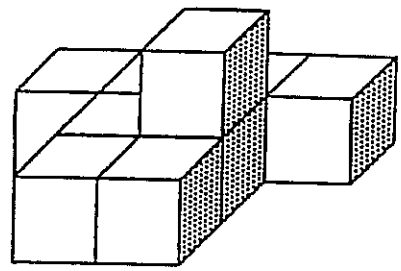
(This shows my own thinking.)

★★ 1. Using 4 fours with any operations or grouping symbols, write an expression that has a value of 7.

4 4 4 4 = 7

Answer: _____

★★★ 2. To glue these 9 cubes together, how many square surfaces must be joined?



Answer: _____

★★ 3. It was 3:00 PM when Akita measured the depth of her fish pond to be three and one half feet. It was filling at a rate of 1 inch per minute. When would it be 8 feet deep so she could turn the pump off?

Answer: _____ o'clock

★★★ 4. In a summer camp, counselors often split the campers into 3, 5 or 6 equal groups but they always ended up with one extra camper. Today they split the campers into 7 equal sized groups and there were no campers left over. What is the smallest number of campers at this camp?

Answer: _____ campers

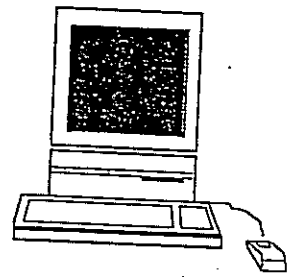
★★★ 5. Find the pattern. Use it to write the next 4 terms in the blanks.

1, 1, 2, 3, 5, 8, 13, 21, ____, ____, ____, ____, . . .

★★★ 6. The sum of 5 different positive integers is 500. What is the largest possible value for one of these integers?

Answer: _____

★★ 7. Four typists can type a total of 200 letters in 2 days. How many letters can two of these typists type in one day?



Answer: _____ letters

★★ 8. In how many ways can the Williams family, shown in the picture, arrange themselves in a line? Don't count the dog as a family member!

Answer: _____ ways

★★ 9. Write an equation and solve it to answer the question in this problem.

> Fingernails grow about 1.5 inches per year. How many years y would it take to grow a world record nail of 37 inches, starting with your present length of about 1/2 inch?

Answer: Equation: _____ Solution: $y =$ _____

★★★ 10. Write an equation and solve it to answer the question in this problem.

> Carrie started saving with a $10 gift from Grandma. She saved half her allowance a each week. At the end of a year she had $88. How much per week was her allowance?

Answer: Equation: _____ Solution: $a =$ _____