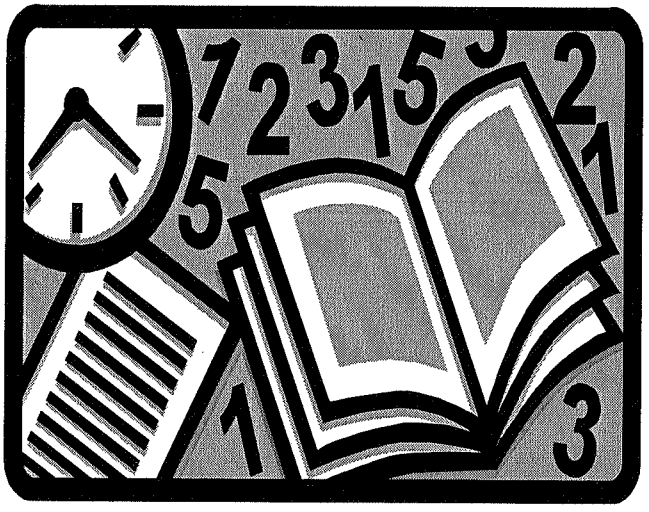
GT Copy

Good practice for 6th Grade Math
or a push up book for 4th/5th Gr. GT Math

What Students Should Know When They Enter Grade 6

Mathematics

A Summer Guide for Parents and Students



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FOREWORD

Quality curriculum is basic to the educational program in The Howard County Public School System, providing the structure and the substance of what is taught to all students. The body of knowledge in any area is virtually infinite in that it is constantly changing and expanding as "new" knowledge is developed and "old" knowledge is refined. Thus, any attempt to set forth a definitive curriculum guide has inherent limitations. Nevertheless, it is important that a school system have a structure for the instructional program that provides direction, focus, flexibility, and state-of-the-art thinking about each content area.

We recognize that no body of knowledge in any subject area is discrete; knowledge is overlapping and interrelated. Thus, although there is a curriculum guide for each subject, curriculum is, and should be, interdisciplinary in focus. Students need to be taught to make connections between and among disciplines. They also need to understand the global nature of the world in which they live, respecting and drawing on the richness of a diverse society. Accordingly, curricula are written so that every child, in every classroom in The Howard County Public School System sees himself or herself in the materials used and the lessons taught. Each classroom must reflect its place as a multiethnic, multicultural microcosm of the world.

This guide has been developed by a team of teachers and other staff within the school system, drawing from the vast body of their collective experience in working with students. While they share both the pride and the responsibilities of authorship, it is our feeling that this guide and the others like it represent the essential elements of what education is in The Howard County Public School System.

John R. O'Rourke
Superintendent of Schools

Kimberly A. Statham
Chief Academic Officer

Robert O. Glascock
Assistant Superintendent
Curriculum and Instruction

Clarissa B. Evans
Director
Secondary Curricular Programs

Nancy J. Metz
Coordinator
Secondary Mathematics

ACKNOWLEDGEMENTS

The *Summer Guide for Parents and Students (What Students Should Know When They Enter Grade 6 Mathematics)* is the result of ongoing planning and development by the staff of the Howard County Secondary Mathematics Office. Charles Koppelman and Dale Harriman were the authors and editors of this guide under the direction of Nancy Metz.

Special appreciation is extended to:

Jon Wray	Elementary Mathematics Resource Teacher
Angie Taury	Typist and Graphics Personnel
Niki Harris	Consulting Editor

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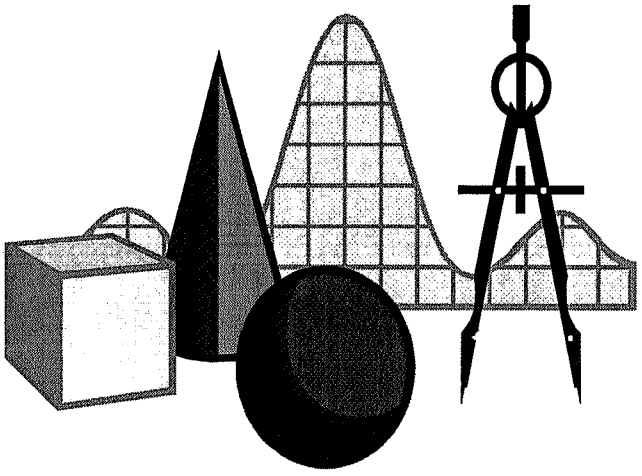
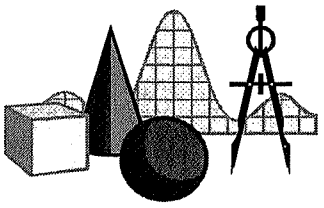


INTRODUCTION



Meeting concerned parents and community members who are actively engaged in children's learning is an ongoing source of inspiration to the Howard County Public School System teachers and administrators. This guide *What Students Should Know When They Enter Grade 6 Mathematics – A Summer Guide for Parents and Students* has been developed to take advantage of the willingness of friends, family, and school system and community resources to work together to help students reach their full potential.

The booklet has been designed to provide a basic understanding to family and students of the mathematics knowledge needed by students entering a grade 6 mathematics course. The Howard County Office of Mathematics recommends that students complete this booklet during the summer and **bring it with work shown to school on the first day of grade 6**. Assistance with the booklet will be provided at the beginning of the school year. Completion of this booklet over the summer between grades 5 and 6 will be of great value to helping students successfully meet the academic challenges awaiting them in middle and high school. These challenges include

- The Maryland Functional Mathematics Test, which students must pass before grade 9
- The Maryland State Assessments in mathematics given in grades 6, 7, 8, and 10
- The Maryland High School Assessments given to algebra and geometry students.

Included in this booklet are the following:

- A table consisting of 5th grade "on-grade level" instructional objectives with appropriate clarifying examples and a cross reference to the mathematics problems provided for student practice in the booklet

- A set of sample questions for the Maryland Functional Mathematics Test (MFMT)* administered to students for the first time in October of Grade 6

- A set of sample questions from *TerraNova* providing practice for the grade 6 Maryland State Assessment (MSA) in mathematics

- A set of problems representing remaining Grade 5 outcomes not specifically tested by MFMT and/or *TerraNova Mathematics*.

*The MFMT is administered to students in Grade 6. **Passing the MFMT is a middle school requirement**.

Directions:

- Students are requested to work in pencil and show their work in the booklet or on lined paper to accompany the booklet. **No calculator use please.**

- Parents/Guardians are asked to remove the answer key, which appears on the final pages of the booklet, and provide answers to students only when they complete a set of problems.

Families are encouraged to use the many resources made available by the Howard County Office of Mathematics and other community resources. Among these are:

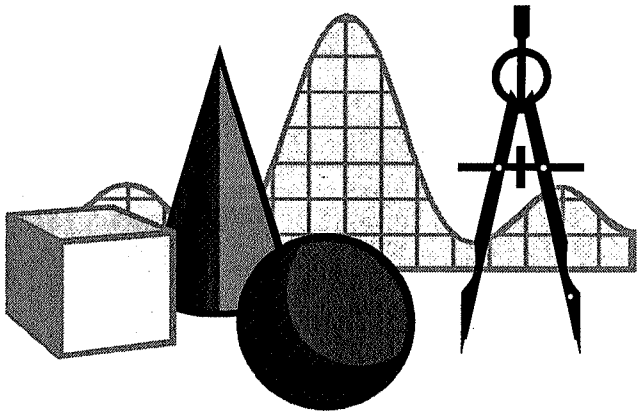
- The Secondary Mathematics website http://www.howard.k12.md.us/math/ and click on Secondary Mathematics Internet Resources) has links to dozens of mathematics related websites containing activities, tutorials, games, puzzles and lists of resources at every level.

- The *MFMP Handbook for Parents*, available through the student's school, contains information about the Maryland Functional Mathematics Test as well as domain quizzes and sample tests.

- The Howard County Public Library's website (www.hcl.org) allows free access to *Live Homework Help*, offering assistance at all levels of secondary mathematics.

- Summer intervention programs for students are available at each middle school grade level.

GRADE 5
MATHEMATICS
GOALS



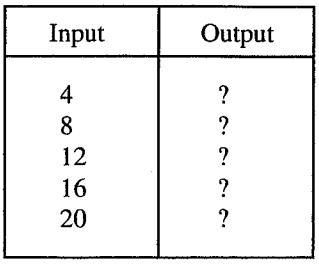
GRADE 5 MATHEMATICS GOALS

Goal 1: The student will demonstrate the ability to solve problems involving whole numbers using the four basic operations; choose the appropriate operation and describe the effects of operations on numbers; collect, display, and interpret data using oral and written formats.

Problem Solving Strategies (Integrated throughout all four Goals)

Instructional Objective(s) The students will be able to:	**Clarifying Examples**	**MFMT** Pg 14-17	***TERRA-NOVA*** Pg 18-38	**HCPSS** Pg 39-56
a. Select and then apply appropriate strategies to solve a problem from visual (draw a picture or diagram, create list, table or graph, act it out, use manipulatives, use spatial reasoning), numerical (guess and check, look for a pattern), and symbolic (write an equation, working backwards) perspectives.	(Make a Table): Andrew had $3.70 in dimes and quarters in his coin collection. He had 9 more dimes than quarters. How many quarters did Andrew have? (8 quarters and 17 dimes)		Pg 29 # 46	

Algebra, Patterns, and Functions

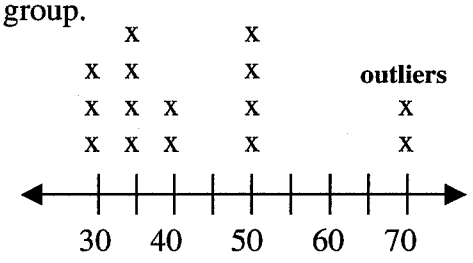
Instructional Objective(s) The students will be able to:	**Clarifying Examples**	**MFMT** Pg 14-17	***TERRA-NOVA*** Pg 18-38	**HCPSS** Pg 39-56
a. Identify, create, and extend a variety of numeric and non-numeric patterns.			Pg 22, 23 # 12-16	
b. Analyze patterns and generalize rules illustrated in patterns.			Pg 20 # 8	
c. Complete a function table when given a rule.	 Multiply each number in the input by 4 (Rule = 4n).		Pg 19 # 6	

Input	Output
4	?
8	?
12	?
16	?
20	?

Number Relationships and Computation

Instructional Objective(s) The students will be able to:	**Clarifying Examples**	**MFMT** Pg 14-17	***TERRA-NOVA*** Pg 18-38	**HCPSS** Pg 39-56
a. Use referents and chunking to estimate quantities (ongoing throughout the year).	Count out an easily identifiable amount to gain a reference point or number. An example might be using 10 marbles as a reference for a large jar filled with marbles.			
b. Identify place value and state the value of each digit in a given numeral to 1,000,000,000.		Pg 14 # 1		
c. Explain the meaning of the equal sign in an equation.	Model equivalence by using a balance scale to illustrate a number sentence like 2 x 2 = 4.  Also, what number(s) would make the scale in balance? 5 x □ 2 x □		Pg 23,24 # 18–21	
d. Read, write, and compare (using >, <, =, ≠) numerals to 1,000,000,000.			Pg 23,24 # 17, 22	
e. Write numerals using expanded notation.				
f. Add and subtract numbers up to six-digits with regrouping.		Pg 14 # 5, 6		
g. Round whole numbers to the nearest hundred thousand.			Pg 24,25 # 23-28	
h. Use rounding to estimate sums and differences.			Pg 21 # 10, 11	

Statistics

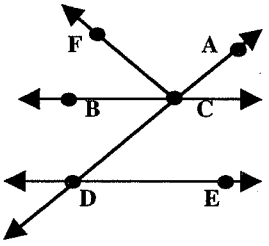
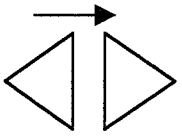
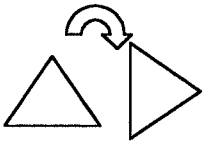
Instructional Objective(s) The students will be able to:	**Clarifying Examples**	**MFMT** Pg 14-17	***TERRA-NOVA*** Pg 18-38	**HCPSS** Pg 39-56
a. Analyze, interpret, and make predictions (in oral and written form) based on tables, single and double bar graphs, line plots, single and double line graphs, stem and leaf plots, and back-to-back stem and leaf plots.	Stem and Leaf Plot Stem | Leaf 3 | 2 3 3 4 | 4 5 5 5 | 1 6 | 9	Pg 16 # 22, 23	Pg 37,38 # 74	
b. Organize and display data using tables (frequency tables), single and double bar graphs, line plots, single and double line graphs, stem and leaf plots, and back-to-back stem and leaf plots.	There are significantly more pieces of data in the 4's stem and significantly fewer pieces of data in the 1's stem. Using the stem-and-leaf plot, what is the greatest number in the data set minus the least number in the data set? Solution: 69 – 32 = 37 The **range** would be 37.		Pg 27 # 34	Pg 39 # 1-9
c. Describe the shape and important features of a data set (using the terms cluster, range, and outlier).	**Outliers** are isolated groups of points, such as points or scores of 70, when compared to the **cluster** or rest of the group.			
d. Find the mean, median, mode, and range of a data set.		Pg 16 # 24	Pg 25,26 # 29-33	
e. Interpret a data set based on the mean, median, mode, and range.				Pg 40 # 1-10
f. Use graphing software (i.e. *GraphLinks*, *GraphPower*, *GraphClub*, or Microsoft Excel) to construct tables, spreadsheets, and graphs.				

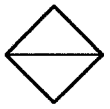
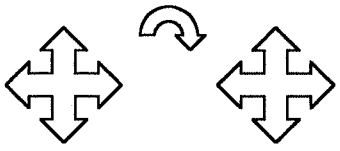
Number Relationships and Computation

Instructional Objective(s) The students will be able to:	**Clarifying Examples**	**MFMT** Pg 14-17	***TERRA-NOVA*** Pg 18-38	**HCPSS** Pg 39-56
a. Identify prime numbers and composite numbers through 100.				Pg 40 # 11-19
b. Express a number as the product of its prime.	The prime factorization of 18 = 3 x 3 x 2.			
c. Recall and use multiplication facts for computation and problem-solving situations.			Pg 27 # 35	
d. Multiply a three-digit number by a two-digit number.		Pg 14 # 7		
e. Use divisibility rules to determine if numbers are divisible by 2, 3, 5, 6, and 10.	The divisibility rule for 6 is if the number is divisible by 2 and 3, then it is divisible by 6.		Pg 27 # 36-38	
f. Divide a four-digit number by a one-or two-digit divisor.		Pg 14 # 8	Pg 28 # 39-43	
g. Interpret the remainder for a given situation.	There were 39 people on a bus when it broke down. People were driven home, 5 in each car. How may cars were used?		Pg 28 # 44	
h. Estimate quotients.	39 ÷ 5 = 7 R 4. You need to add the remainder and use 8 cars.		Pg 29 # 45	
i. Solve a problem by choosing one of the following methods of computation: mental math, estimation, use of a calculator, or use of an algorithm.	Movie tickets cost $5. How many can be purchased with $39? 39 ÷ 5 = 7 (Drop the R 4.)	Pg 17 # 26, 28	Pg 18,19 # 2, 4	

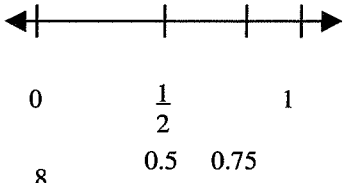
GOAL 2: The student will be able to demonstrate the ability to solve problems using concepts in geometry, fractions, and decimals; communicate the solutions of problems through written and verbal formats.

Geometry

Instructional Objective(s) The students will be able to:	**Clarifying Examples**	**MFMT** Pg 14-17	***TERRA-NOVA*** Pg 18-38	**HCPSS** Pg 39-56
a. Identify, describe, label, and draw points, lines, line segments, and rays.	Identify points, angles, lines, line segments, rays in the figure. 		Pg 30 # 47,48	
b. Identify, describe, and classify lines as intersecting, parallel, or perpendicular.			Pg 30 # 49	
c. Identify, classify, measure (using a protractor), draw and label acute, right, and obtuse angles.			Pg 30,31 # 50-52	
d. Identify, define, and classify triangles as equilateral, isosceles, right, or scalene.			Pg 31 # 53,54	Pg 41 # 1-11
e. Identify the radius, diameter, and circumference of a circle.				Pg 42 # 1-10
f. Construct or draw two-dimensional figures (squares, triangles, rectangles, and circles) given their dimensions using tools and technology (*MicroWorlds*, *Geometer's Sketchpad*, etc.)				
g. Identify and model transformations: translations, reflections, and rotations.	Translation 			Pg 43 # 1-9
h. Identify, describe, and represent similarity and congruency of geometric figures and real-world objects using the appropriate symbols.	Rotation 			Pg 44 # 1-16

i. Identify and describe line and rotational symmetry in two- and three-dimensional shapes and designs using concrete objects and technology (appropriate software applications and the Internet).	Line Symmetry  **Rotational Symmetry** exists when a figure can be rotated less than 360° about a central point, called the point of rotation, and be made to match the original figure. 			

Number Relationships and Computation

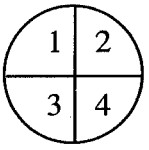
Instructional Objective(s) The students will be able to:	**Clarifying Examples**	**MFMT** Pg 14-17	***TERRA-NOVA*** Pg 18-38	**HCPSS** Pg 39-56
a. Read and write a fraction for a given region or part of a set. b. Compare and order fractions and mixed numerals and locate their positions on a number line.	Use a number line from 0 to 1 and place fractions on the number line. Display a number line that shows common fractions and decimals.  0 $\frac{1}{2}$ 1 0.5 0.75 Simplify $\frac{8}{12}$.		Pg 18 # 1	
c. Find factors and common factors of numbers. d. Simplify fractions using the greatest common factor.	Factors of 8 = 1, 2, 4, 8 Factors of 12 = 1, 2, 3, 4, 6, 12 Common Factors = 1, 2, 4 GCF = 4 $\frac{8}{12} \div \frac{4}{4} = \frac{2}{3}$		Pg 31 # 55 Pg 32 # 56,57	
e. Find multiples and common multiples of numbers. f. Identify and find the least common multiple to determine the least common denominator.	There are 50 people in a 5K road race. Every 6th finisher gets a tee-shirt, every 8th finisher gets a hat. Use multiples and common multiples to determine who gets a tee shirt and hat.		Pg 32 # 58-60	Pg 45 # 1-13

g. Rename mixed numerals as improper fractions and improper fractions as mixed numerals.				Pg 46 # 1-16
h. Add fractions with like and unlike denominators with sums greater than and less than one.				Pg 47 #1-12
i. Subtract fractions with like and unlike denominators with regrouping.				Pg 48 # 1-12
j. Add and subtract mixed numerals with like and unlike denominators with and without renaming.		Pg 14, 15 # 9, 10		
k. Multiply a fraction by a whole number.	1/3 of 12 = 4 and 2/5 of 10 = 4	Pg 15 # 11		
l. Identify equivalent decimals through thousandths.	Use base ten blocks to compare and explain why 0.4 = 0.400.	Pg 14 # 1		
m. Read, write, compare, and order decimals through thousandths and show relationship to common fractions.	Develop the relationship between common fractions and decimals. 1/20 = 5/100 = 0.05 4/5 = 80/100 = 0.8 = 0.80 = 0.800	Pg 14 # 4		
n. Represent fractions, mixed numbers, and decimals (through thousandths) on a number line.				
o. Round decimals to hundredths.				Pg 49 # 1-6
p. Add and subtract decimals through thousandths.	Add decimals in vertical and horizontal formats with various place values.	Pg 15 # 13, 14 Pg 17 #27	Pg 18 # 3	
q. Estimate sums and differences through thousandths.	1.25 + .45 + .008 = ☐			Pg 49 # 7-9
r. Multiply a whole number by a decimal (tenths/hundredths).		Pg 15 # 15		
s. Divide a decimal by a whole number.		Pg 15 # 16		

t. Select appropriate symbols and operations to solve multi step problems including money.	In June of 1993, Melissa won a contest. The prize was $50 for each month she had been living up to and including June of 1993. If Melissa was born in April of 1975, how much money did she win? ($10,900)		Pg 33 # 61,62	

GOAL 3: The student will be able to demonstrate the ability to solve problems using concepts in probability; apply algebraic thinking to new situations; use measurement concepts to solve real-life problems; explain solutions in written form.

Probability

Instructional Objective(s) The students will be able to:	**Clarifying Examples**	**MFMT** Pg 14-17	***TERRA-NOVA*** Pg 18-38	**HCPSS** Pg 39-56
a. List all possible outcomes of an event with a limited number of possible results.	There are 4 marbles in a bag. The colors are red, blue, green and yellow. What are the possible outcomes if you pull a marble and replace it? *You could pull a red, blue, green, or yellow marble.*			Pg 50 # 1-3
b. Find the probability of an event with equally likely outcomes and express as a fraction or a ratio.			Pg 33,34 # 63, 64	
c. Conduct an experiment and make a prediction based on the outcomes of the experiment.				
d. Analyze a given spinner for fairness; revise, if needed, to reflect equal outcomes.	**Probability of:** — **Fraction** • Landing on a 2 — 1/4 • Landing on an odd number — 2/4 or 1/2 • Landing on a number > 1. — 3/4			

Algebra, Patterns, and Functions

Instructional Objective(s) The students will be able to:	**Clarifying Examples**	**MFMT** Pg 14-17	***TERRA-NOVA*** Pg 18-38	**HCPSS** Pg 39-56
a. Write the rule for a given function. b. Construct a function table to solve a problem.	In | Out 6 | 11 7 | 8 | 9 | The rule is n + 5.		Pg 20 # 8	
c. Use grouping symbols (parentheses) to evaluate expressions.	Evaluating expressions complete the operation in the parenthesis first. 6 x (2 + 3) = 6 x 5 = 30			
d. Write numeric expressions in equivalent forms.	A numerical expression is a phrase that has only numbers and operations. 8 - 3.			
e. Write simple algebraic expressions with one unknown and evaluate by substitution.	An algebraic expression has variables (a variable is a letter that represents one or more numbers), n + 3.			
f. Solve for the unknown in an equation (one unknown, one operation) with whole number coefficients.	When you evaluate an expression you substitute the variable with a given number. Evaluate each expression if n = 5 and p = 7 n + 5 8 - p		Pg 20 # 7	Pg 51 # 1-6
g. Identify the ordered pairs for points and locate the points for ordered pairs in the first quadrant of a coordinate plane.	When you see a variable and a number together 3n (indicating multiplication), the 3 is the coefficient, 2n = 8.			

Measurement

Instructional Objective(s) The students will be able to:	**Clarifying Examples**	**MFMT** Pg 14-17	***TERRA-NOVA*** Pg 18-38	**HCPSS** Pg 39-56
a. Use standard units (yards, meters, degrees, and other units) to measure objects.		Pg 16 # 18		
b. Select and use benchmarks to estimate measurements.	• A benchmark for the height of an object or room is your own height. • The tip of your thumb is about			
c. Select the appropriate tool/unit for measuring attributes of length (including perimeter, width, height, circumference, and distance) area, weight temperature, time, capacity, volume, and size of angle (using a protractor).	• an inch. • A ten (long) in base ten blocks = 10 cm.	Pg 16 # 20		
d. Use equivalent units within the same system (convert between inches, feet, and yards; millimeters, centimeters, meters).			Pg 34,35 # 65-70	
e. Estimate and determine the perimeter of polygons and real-world objects.	If the perimeter of a rectangle is 26 inches, and the width is 4 inches, what is the length?	Pg 16 # 19	Pg 19 # 5	
f. Determine the lengths of the sides of a regular polygon, given the perimeter.	The perimeter of a regular hexagon is 42 inches. What is the length of one of the sides?			
g. Estimate and determine the area of rectangles, and estimate the area within any closed figure.	Estimate the area of an irregular figure by showing the figure on graph paper and using the grid lines.		Pg 21 # 9	
h. Use formulas to find the area of a rectangle, square, triangle and parallelogram.	Given 60 feet of fencing, determine all of the rectangular regions whose dimensions are whole numbers. Which has the largest area?			Pg 52 # 1-8
i. Represent how the perimeter of a two-dimensional figure can change when the area stays constant.	Use the 12 pentomino shapes to show that the area is 5 square units, but the perimeters are different.			

j. Estimate and determine the volume of a rectangular prism using manipulatives and formulas (V= lwh).		Pg 17 # 25		Pg 53 # 1-6
k. Determine perimeters, areas, and volumes of irregular shapes.				
l. Determine the surface areas of a cube and rectangular prism.				Pg 54 # 1-3
m. Identify factors that affect precision in measurement.	Precision in measurement depends on the use of appropriately sized units. A precise or smaller unit of measurement is required when cutting a glass pane. The smaller unit of measure, the more precise the measurement.			
n. Estimate and determine elapsed time to solve real-world problems.	Martha logged onto the Internet at 11:25 a.m. She stayed on for 2 hours and 10 minutes. When did she log off? (1:35 p.m.)	Pg 16 # 21		

GOAL 4: The student will demonstrate the ability to solve real-life problems using fractions, ratios, proportions, and percents; collect, display, and interpret data using oral and written formats.

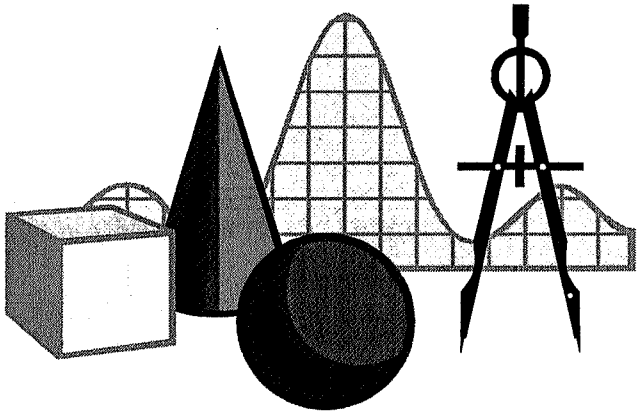
Statistics

Instructional Objective(s) The students will be able to:	**Clarifying Examples**	**MFMT** Pg 14-17	***TERRA-NOVA*** Pg 18-38	**HCPSS** Pg 39-56
a. Describe the shape and important features of a data set using the terms cluster, range, and outlier.	Data Set: 1, 34, 35, 35, 36, 87. 1 and 87 are **outliers**. Numbers that are larger or smaller than most of the other numbers in the set are **outliers**.			
b. Interpret a circle graph.			Pg 36,37 # 71-73	
c. Use graphing software to construct tables and graphs.				

Number Relationships and Computation

Instructional Objective(s) The students will be able to:	**Clarifying Examples**	**MFMT** Pg 14-17	***TERRA-NOVA*** Pg 18-38	**HCPSS** Pg 39-56
a. Explain and give an example of ratio and equal ratio.				Pg 55 # 1-8
b. Identify equal ratios by finding equivalent fractions.	The ratio 3:6 is the same as 1:2. If you have 6 marbles in a bag and 3 are blue, you have a 3:6 chance of pulling a blue marble. That is the same as 1 out 2.	Pg 15 # 12		
c. Identify percent and use the symbol for percent (%).				
d. Represent fractions, decimals, and percents in equivalent forms using a variety of strategies including models and drawings.	Using a 10 x 10 grid with 54 of the cells shaded, express the shaded amount as a fraction, decimal, and percent. Explain why each is correct.	Pg 14 # 2, 3		
e. Calculate and estimate the percent of a given number.		Pg 15 # 17		Pg 56 # 1-8
f. Calculate the percent of a number using the % key on a calculator.	What is 36% of 24? 36% is close to 1/3. So it is about 8. Input 0.36 x 24 into the calculator. Press the % key to arrive at 8.64.			
g. Use percent to solve problems involving sales, commissions, and tips.		Pg 17 # 29		

MFMT DOMAINS AND SAMPLE QUESTIONS



The 30 items on the Sample Maryland Functional Math Test (MFMT) that appear on the following pages correspond to the domain objectives listed in the table below. This cross-reference may be used to identify those objectives on which your child may need additional practice. Parents are encouraged to keep a record in the "Needs Practice" column of those items the student answered incorrectly.

DOMAIN	ITEM #	OBJECTIVE	Needs Practice
Number Concepts	1	Write numbers in words and digits.	
	2	Rename fractions as percents.	
	3	Rename percents as decimals.	
	4	Order decimals.	
Whole Number Operations	5	Add whole numbers.	
	6	Subtract whole numbers.	
	7	Multiply whole numbers.	
	8	Divide whole numbers.	
Mixed Number and Fraction Operations	9	Add mixed numbers.	
	10	Subtract mixed numbers.	
	11	Multiply a whole number by a fraction.	
	12	Find a missing term in a proportion.	
Decimal Operation	13	Add decimals.	
	14	Subtract decimals.	
	15	Multiply decimals.	
	16	Divide decimals.	
	17	Find a percent of a number.	
Measurement	18	Read scales on measuring instruments.	
	19	Find perimeter/area of simple polygons.	
	20	Choose an appropriate unit of measure.	
	21	Find elapsed time.	
Using Data	22	Use information from tables.	
	23	Use information from graphs.	
	24	Find the average of a set of numbers.	
Problem Solving	25	Use a simple formula.	
	26	Choose a reasonable answer for a mathematical problem.	
	27	Solve money problems using addition and subtraction.	
	28	Solve money problems using multiplication and division.	
	28	Find a missing term in a proportion.	
	29	Solve problems using percents.	
	30	Make change.	

MFMT SAMPLE QUESTIONS

1. Choose the number name:

fifty-four and three tenths

A. 54.03
B. 50.3
C. 54.3
D. 5.43

2. Rename $\frac{7}{10}$ as percent:

A. 7%
B. 710%
C. $\frac{7}{10}$ %
D. 70%

3. Rename 27% as a decimal:

A. .027
B. 270
C. 2.7
D. .27

4. Which group of numbers is in order from least to greatest?

A. 5, .5, .05, .005
B. .005, .05, .5, 5
C. .05, .005, .5, 5
D. .5, .005, .05, 5

5. ADD:

$$\begin{array}{r} 3657 \\ 647 \\ +\,446 \\ \hline \end{array}$$

A. 4750
B. 3630
C. 4650
D. 4650

6. SUBTRACT:

$$\begin{array}{r} 4354 \\ -3538 \\ \hline \end{array}$$

A. 816
B. 806
C. 1224
D. 842

7. MULTIPLY:

$$\begin{array}{r} 344 \\ \times\ 54 \\ \hline \end{array}$$

A. 20576
B. 18556
C. 18576
D. 17576

8. DIVIDE:

$29\overline{)2262}$

A. 78
B. 87
C. 77
D. 68

9. ADD and SIMPLIFY:

$$\begin{array}{r} 4\frac{3}{5} \\ +\,2\frac{1}{3} \\ \hline \end{array}$$

A. $6\frac{4}{8}$
B. $6\frac{11}{15}$
C. $2\frac{1}{15}$
D. $6\frac{14}{15}$

10. SUBTRACT and SIMPLIFY:

$$\begin{array}{r} 4\frac{5}{8} \\ -2\frac{1}{4} \\ \hline \end{array}$$

A. $2\frac{1}{8}$
B. $2\frac{3}{8}$
C. $2\frac{1}{4}$
D. $2\frac{1}{2}$

11. MULTIPLY and SIMPLIFY:

$$3 \times \frac{2}{9} =$$

A. $\frac{6}{9}$
B. $\frac{3}{2}$
C. $\frac{2}{3}$
D. $\frac{27}{2}$

12. FIND THE MISSING TERM:

$$\frac{N}{6} = \frac{2}{3}$$

A. 1
B. 12
C. 4
D. 18

13. ADD:

$$34.8 + 2.353 + .56 =$$

A. 58.89
B. 37.713
C. 36.713
D. 37.717

14. SUBTRACT:

$$\begin{array}{r} 45.4 \\ -\ 8.83 \\ \hline \end{array}$$

A. 43.43
B. 37.63
C. 36.57
D. 37.57

15. MULTIPLY:

$$\begin{array}{r} 47 \\ \times\ 3.6 \\ \hline \end{array}$$

A. 1692
B. 16.92
C. 169.2
D. 1.692

16. DIVIDE:

$$7\overline{)25.83}$$

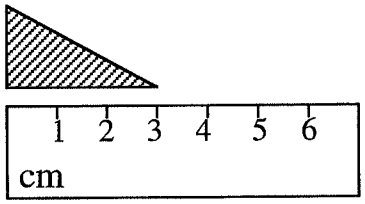
A. 3.7
B. 3.69
C. 4.69
D. 3.68

17. SOLVE:

45% of 63 =

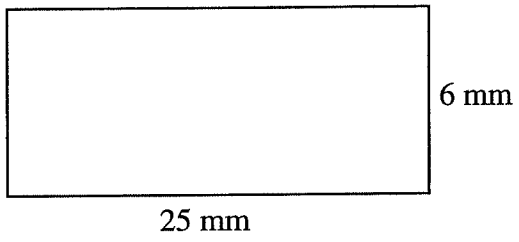
A. 283.5
B. 28.35
C. 2.835
D. .2835

18. Find the length of the base of the triangle to the nearest centimeter.



A. 3 cm
B. 4 cm
C. 5 cm
D. 6 cm

19. Find the perimeter of this rectangle:



A. 150 mm
B. 112 mm
C. 31 mm
D. 62 mm

20. The volume of water in a swimming pool would be best measured in:

A. m
B. m^2
C. m^3
D. m^4

21. Your teacher begins work at 8:30 a.m. and leaves work at 3:00 p.m. How long is the teacher's school day?

A. 5 hours and 30 minutes
B. 6 hours and 30 minutes
C. 7 hours and 30 minutes
D. 8 hours and 30 minutes

22. How much would a deluxe version of a 1993 truck cost?

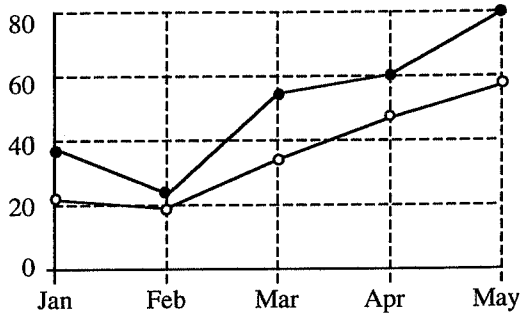
Sale Prices of a New Truck

	Basic	Deluxe
1993	$17,345	$21,432
1994	$18,589	$22,216

A. $17,345
B. $21,432
C. $18,589
D. $22,216

23. What was the approximate high temperature in March?

High and Low Temperatures



A. 58°
B. 32°
C. 62°
D. 42°

24. What is the average enrollment of the five schools?

School	Total Students
Atholton	1100
Oakland Mills	1050
Glenelg	1150
Hammond	900
Centennial	1300

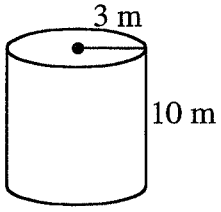
A. 900
B. 1000
C. 1100
D. 1200

25. The formula for volume of a cylinder is

$$\mathbf{V = \pi \times r \times r \times h}$$

r represents the radius, *h* is the height, π is 3.14, and *V* is the volume.

What is the volume of the cylinder below?



A. 282.6 m^3
B. 904.20 m^3
C. 90 m^3
D. 188.4 m^3

26. If a pen costs \$1.15, and you need seven for your school, about how much will they cost?

A. \$6
B. \$7
C. \$8
D. \$9

27. You purchase a pair of shoes which cost \$65.26, and a pair of socks which cost \$4.25. If you gave the clerk \$70, how much change should you receive?

A. \$.39
B. \$.49
C. \$1.39
D. \$1.49

28. You and three friends go to the store and buy two video games for \$26 each. If the four of you decide to split the bill evenly, how much will each have to pay?

A. \$26
B. \$56
C. \$12
D. \$13

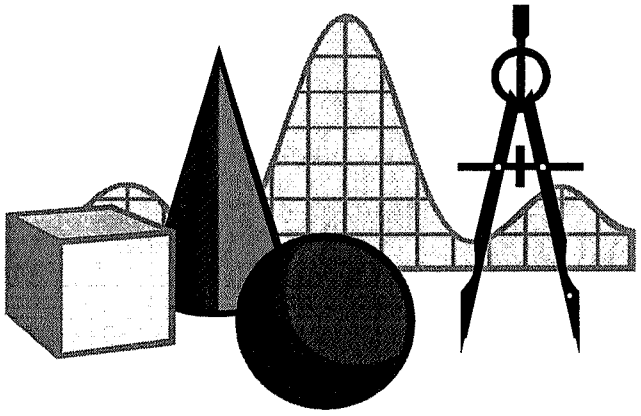
29. Your family just purchased a new home for \$125,300. If the real estate sales tax is 3%, how much tax would your family pay?

A. \$3.76
B. \$3759
C. \$37.59
D. \$823.90

30. If you spend \$5.32 for refreshments at the movie theater and you give the cashier ten dollars, what change should you receive?

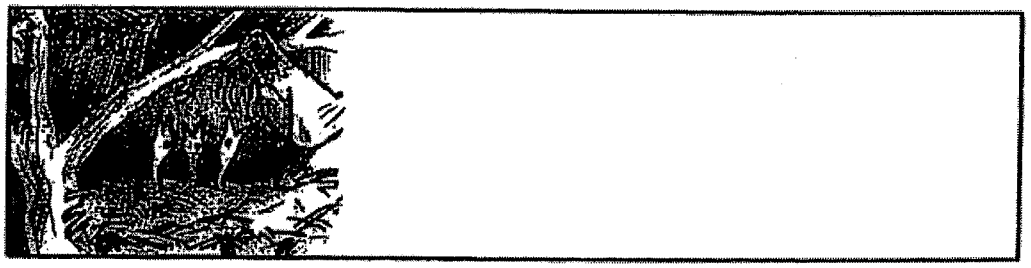
A. 3 pennies, 5 nickels, 2 quarters, and 4 one-dollar bills
B. 3 pennies, 2 nickels, 1 dime, 2 quarters, and 4 one-dollar bills
C. 4 pennies, 2 nickels, 6 quarters, and 3 one-dollar bills
D. 3 pennies, 1 nickel, 1 dime, 2 quarters, and 4 one-dollar bills

SAMPLE *TERRANOVA* QUESTIONS



SAMPLE *TERRANOVA* ITEMS

1. Shawna is painting a mural on the wall.



Which of these is the **best** estimate for the part of the wall that Shawna has already painted?

A. $\frac{30}{100}$
B. 0.50
C. $\frac{1}{6}$
D. 60%

2. Jamie bought $3\frac{1}{2}$ yards of telephone wire. The wire cost $1.20 per yard. How much did Jamie pay for the telephone wire?

A. $3.60
B. $4.10
C. $4.20
D. $4.70

3. Margot's shopping list shows the prices of all the things that she bought. She paid no added tax. Which of these is the least amount of money that Margot could have given the clerk to pay for her purchases?

F. $10.00
G. $15.00
H. $20.00
J. $25.00

Shopping List	
bread	$ .69
cereal	$ 3.29
apples	$1.59
lettuce	$ .29
rice	$1.19
milk	$1.89
meat	$3.99
peas	$ .39

4. Jeff bought 12 comic books and passed them out equally among his friends. Each friend was given 3 comic books. Which of these would you use to find out how many friends received comic books?

   A. addition
   B. subtraction
   C. multiplication
   D. division

5. Davis has a string that is 30 centimeters long. He made a rectangle with the string. If the length of the rectangle is 12 centimeters, what is its width?

   A. 3
   B. 6
   C. 18
   D. 24

6. Input numbers are changed to output numbers according to the following rule: Multiply the input number by 3 and then subtract 2 to get the output number. Which chart follows the rule?

A.

Input	Output
8	18
2	0
0	-6

B.

Input	Output
8	22
2	4
0	-2

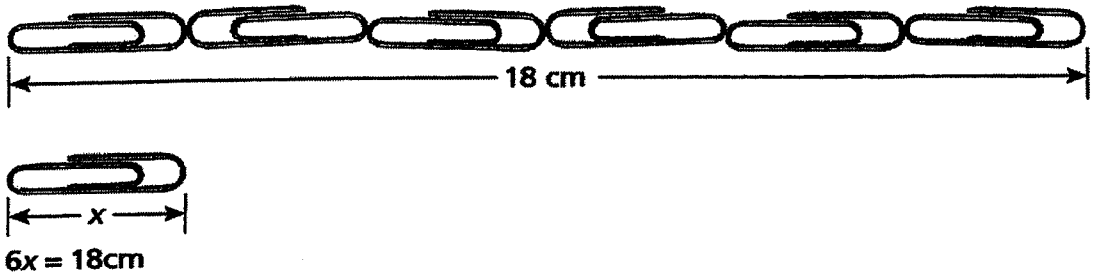
C.

Input	Output
8	22
2	4
0	1

D.

Input	Output
8	24
2	8
0	2

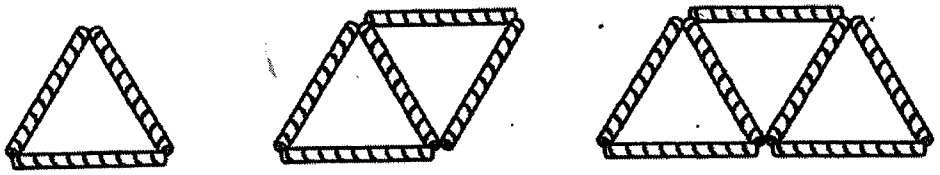
7. Anita lined up 6 paper clips in a row. The row of paper clips is 18 centimeters long. In the equation, x represents the length of each paper clip.



What is the length of one paper clip?

A. 3 centimeters
B. 6 centimeters
C. 12 centimeters
D. 24 centimeters

8. Alex used straws to make the pattern below.



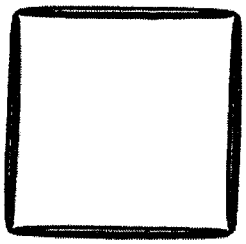
The table below shows the relationship between the number of triangles in a row and the number of straws.

Number of triangles	1	2	3
Number of straws	3	5	7

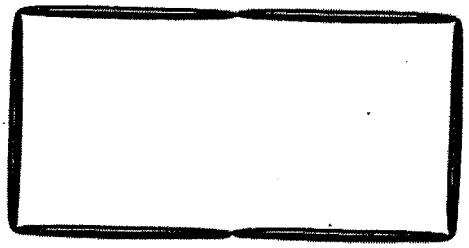
Which of these describes the relationship between the number of triangles in a row and the number of straws?

F. Multiply the number of triangles by 3.
G. Multiply the number of triangles by 2 and add 1.
H. Multiply the number of triangles by 2 and add 2.
J. Multiply the number of triangles by 3 and subtract 2

9. Trevor made these rectangles by putting toothpicks end to end, as shown below.



Rectangle with
4 toothpicks



Rectangle with
6 toothpicks

The length of each toothpick measures 1 unit. Trevor wants to use 14 toothpicks to make a rectangle with the greatest area possible. What is the area of this rectangle?

A. 6 square units
B. 10 square units
C. 12 square units
D. 14 square units

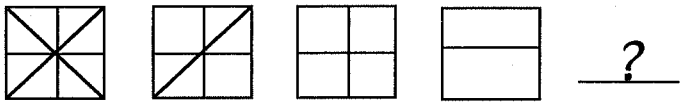
10. On his vacation, Stan drove 873 miles on the first day and 624 miles on the second day. Round to the nearest hundred to estimate how many miles he drove all together.

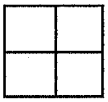
A. 1400
B. 1450
C. 1500
D. 1600

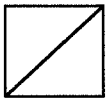
11. A route from Rafael's house to work is 29.5 miles long. Another is 21.6 miles long. Estimate how much longer the first is. (Round numbers to the nearest whole number.)

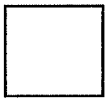
F. 9 miles
G. 8 miles
H. 7 miles
J. 6 miles

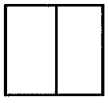
12. Which diagram is next in this pattern?



A. 

B. 

C. 

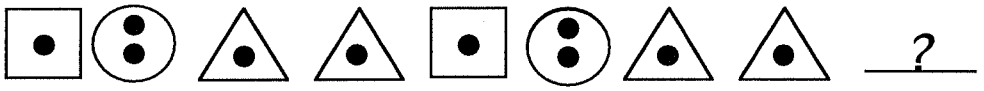
D. 

13. What number comes next in this pattern?

6, 10, 15, 21, 28, ?

F. 35
G. 36
H. 37
J. 38

14. What is the next figure in this pattern?



A. 

B. 

C. 

D. 

15. Which pair of numbers should come next in the column?

A	B
6	2
9	3
12	4
?	*?*

F. (15, 5)
G. (15, 4)
H. (14,5)
J. (14, 6)

16. What is the next number in this pattern?

10, 21, 32, 43, __*?*__

A. 49
B. 51
C. 52
D. 54

17. $72 \div 9 - 5 + 7 = ?$

A. 25
B. 20
C. 9
D. 10

18. $2\frac{1}{4}$ $\boxed{?}$ 2.2

A. x
B. =
C. >
D. <

19. 75% ? $\frac{8}{10}$

F. +
G. =
H. >
J. <

20. $2\frac{1}{2}$? $1.5 + 1.5 + 0.5$

A. +
B. =
C. >
D. <

21. 40% ? $\frac{2}{5}$

F. ÷
G. =
H. >
J. <

22. $7 \times 7 - 7 =$?

F. 49
G. 42
H. 7
J. 0

23. A new computer is advertised as selling for $912. Round this figure to the nearest 10 dollars.

A. $900
B. $905
C. $910
D. $920

24. The distance from Joanna's house to the airport is 128 miles. About how many miles is this distance? (Round to the nearest 100 miles.)

F. 130 miles
G. 120 miles
H. 100 miles
J. 50 miles

25. If you round these numbers to the nearest 100, which number does not round to 700?

A. 651
B. 690
C. 724
D. 750

26. Julio's bill for lunch came to $24.06. He rounded the amount to the nearest $10. What is the rounded amount?

F. $20
G. $24
H. $25
J. $30

27. Andrew sold 3215 tickets for the carnival. Round this figure to the nearest hundred.

A. 3000
B. 3200
C. 3300
D. 4000

28. Round 4500 to the nearest 1000.

F. 4000
G. 5000
H. 5500
J. 6000

29. Find the mean (average) of these numbers: 12, 25, 50, 75, 103.

A. 33
B. 53
C. 54
D. 61

30. The temperatures at noon outside a middle school last week were: 67°F, 68°F, 66°F, 71°F, 67°F, 70°F, and 74°F. What is the mean (average) temperature for the week?

F. 74°F
G. 70°F
H. 69°F
J. 66°F

31. Marcella swam laps three days last week. She swam 35 laps on Monday. 43 laps on Wednesday, and 45 laps on Friday. What is the mean (average) number of laps she swam?

A. 38
B. 39
C. 40
D. 41

32. Find the mean (average) of these numbers: 192, 312, 234, 301, 340, and 109.

F. 238
G. 248
H. 258
J. 268

33. These were the numbers of minutes Khalid practiced playing his trombone this week:

Day	Number of Minutes
Monday	35
Tuesday	50
Wednesday	40
Thursday	50
Friday	35

What is the mean (average) number of minutes that Khalid practiced per day this week?

A. 40
B. 42
C. 43
D. 45

34. Mike and Anna took a survey of 100 students in the sixth grade of the Burlington Elementary School to find out their favorite sports. They found these results:

Football – 25
Basketball – 35
Soccer – 10
Other – 30

Display this data in two different graphs. Each graph should be a different type.

35. Ms. Banerjee can divide her class into groups of 3 students or groups of 5 students. Which of the following is a possible size of her class?

F. 25
G. 26
H. 30
J. 33

36. Which of these numbers evenly divides 455?

F. 2
G. 3
H. 5
J. 9

37. Which of these is NOT a factor of 4020?

F. 3
G. 5
H. 9
J. 10

38. Which of these does NOT evenly divide 45,600?

A. 2
B. 3
C. 5
D. 9

39. Divide 6120 by 8.

A. 763 R2
B. 764 R5
C. 764 R6
D. 765

40. $23\overline{)4438}$

F. 1929 R12
G. 192 R22
H. 192 R2
J. 191 R18

41. $18\overline{)4641}$

A. $256\frac{5}{18}$
B. $256\frac{15}{18}$
C. $157\frac{15}{18}$
D. $256\frac{7}{18}$

42. Divide 5016 by 42.

F. 1194 R10
G. 119 R12
H. 119 R18
J. 118 R22

43. Divide 3240 by 9.

A. 36 R8
B. 36
C. 360
D. 360 R2

44. Dana divided her 154 movie cards into 9 equal piles. How many were in each pile? How many were left over?

A. 16 in each pile, 1 left over
B. 16 in each pile, 2 left over
C. 17 in each pile, 1 left over
D. 17 in each pile, 2 left over

45. Billy has to divide 203 tickets to a concert among 19 students. What is the best estimate of how many tickets each student will get.

A. 2
B. 10
C. 20
D. 30

46. Each bottle of paint on the scale weighs 10 ounces. On the scale in front of the bottles are 2 paint brushes.

1 pound = 16 ounces

On the lines below, explain how you could find the weight of one paintbrush if both paintbrushes are exactly the same.

_____

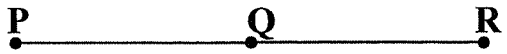
_____

_____

How much does one paintbrush weigh? Write your calculations and answer in the box below.

Answer:_____ ounce(s)

47. Points P, Q, and R are on the same line. The length from P to Q is the same as the length from Q to R. What is Q called?

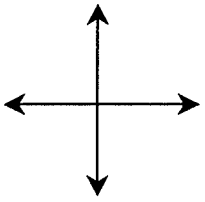


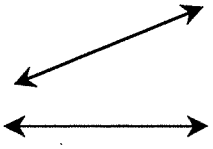
F. midpoint
G. endpoint
H. segment
J. straight line

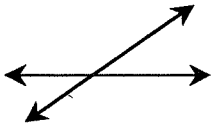
48. An angle is formed by two _____.

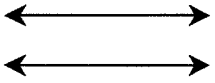
A. segments
B. rays
C. lines
D. points

49. Which of these lines are perpendicular?

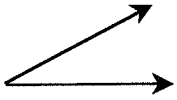
F. 

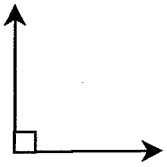
G. 

H. 

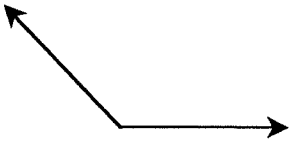
J. 

50. Which angle is an obtuse angle?

F. 

G. 

H. 

J. 

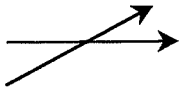
51. Connect points P, Q, and R to form angle PQR. Then choose the correct answer below.

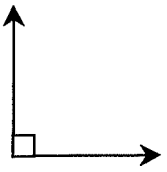
P ●

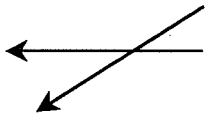
Q ● R ●

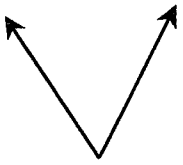
A. The measure of the angle is less than 90°.
B. The measure of the angle is equal to 90°.
C. The measure of the angle is greater than 90°.
D. The measure of the angle is equal to 60°.

52. Which of the following is NOT an acute angle?

F. 

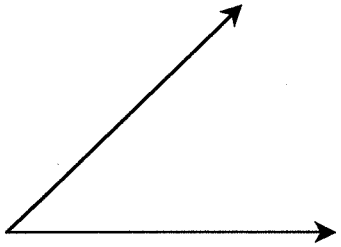
G. 

H. 

J. 

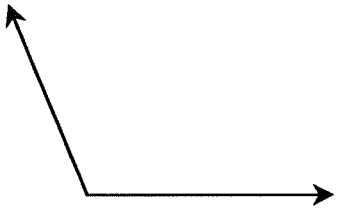
Directions: Use a protractor to measure the angles in questions 53 and 54.

53. What is the measure of this angle?



A. 130°
B. 80°
C. 50°
D. 30°

54. What is the measure of this angle?



A. 115°
B. 80°
C. 50°
D. 30°

55. What are all of the factors of 36?

A. 1, 2, 4, 9, 36
B. 1, 2, 3, 4, 6, 9, 12, 18, 36
C. 1, 2, 3, 4, 6, 9, 36
D. 1, 2, 3, 4, 6, 9, 12, 16, 36

56. Simplify $\frac{15}{35}$.

A. $\frac{4}{7}$
B. $\frac{3}{15}$
C. $\frac{3}{7}$
D. $\frac{5}{7}$

57. Which of the following is equivalent to $\frac{14}{20}$?

A. $\frac{7}{10}$
B. $\frac{1}{2}$
C. $\frac{7}{5}$
D. $\frac{7}{15}$

58. Which number is a multiple of 4 and 7?

A. 8
B. 16
C. 24
D. 28

59. What is the smallest number that is a multiple of both 3 and 4?

A. 12
B. 15
C. 18
D. 30

60. What are the first three multiples of 11?

F. 1, 2, 3
G. 1, 20, 31
H. 11, 22, 33
J. 1, 11, 22

61. The table shows the rates charged by the taxi that takes people into the city from Laura's town:

First mile	**$5.00**
Second through fifth mile	**$3.00 per mile**
After fifth mile	**$2.00 per mile**

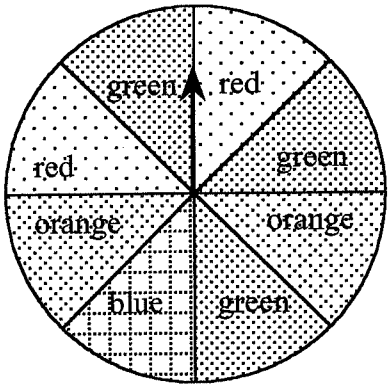
Laura needed a ride that was 13 miles long. How much (in dollars) would the ride cost her?

A. 1 x 5 + 3 x 3 + 9 x 2
B. 1 x 5 + 2 x 3 + 5 x 4
C. 1 x 5 + 4 x 3 + 8 x 2
D. 1 x 5 + 12 x 2

62. Tim takes money out of an automated teller machine every Tuesday morning. He never takes more than $50 and never takes less than $10. After five weeks, what is a reasonable total for the amount of money he withdrew from his account?

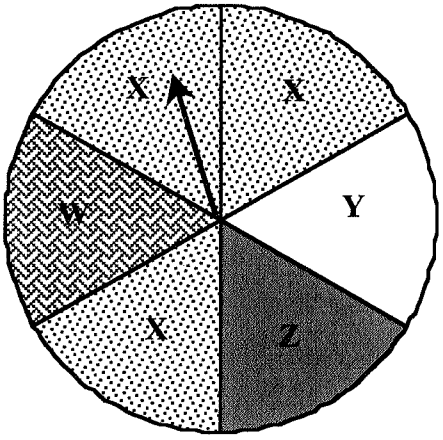
A. less than $50
B. between $50 and $250
C. between $250 and $350
D. more than $350

63. What color are you most likely to spin?



A. orange
B. blue
C. green
D. red

64. If the spinner is spun once, what is the probability of getting X?



A. $\frac{1}{3}$
B. $\frac{1}{6}$
C. $\frac{1}{2}$
D. $\frac{3}{4}$

65. To change from kilometers to meters you multiply by _____.

A. $\frac{1}{10}$
C. 10
D. 100
E. 1000

66. How do you change from grams to kilograms?

F. Divide by 100
G. Divide by 1000
H. Multiply by 100
J. Multiply by 1000

67. Barry lives 4 kilometers from school. What is this measure in meters?

A. 40
B. 400
C. 4000
D. 40,000

68. How do you change from milliliters to liters?

F. Multiply by 100
G. Multiply by 1000
H. Divide by 100
J. Divide by 1000

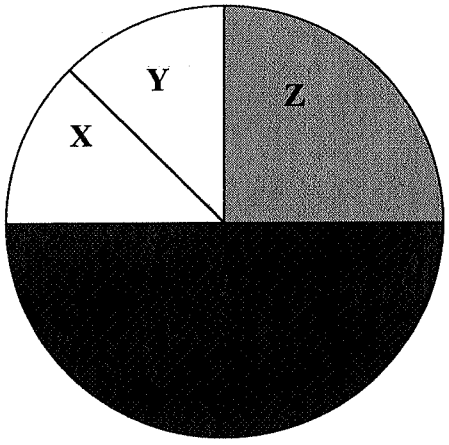
69. Emilia drank 2000 milliliters of milk yesterday. What is this measure in liters?

A. 2
B. 20
C. 200
D. 2000

70. How do you change from milliliters to centimeters?

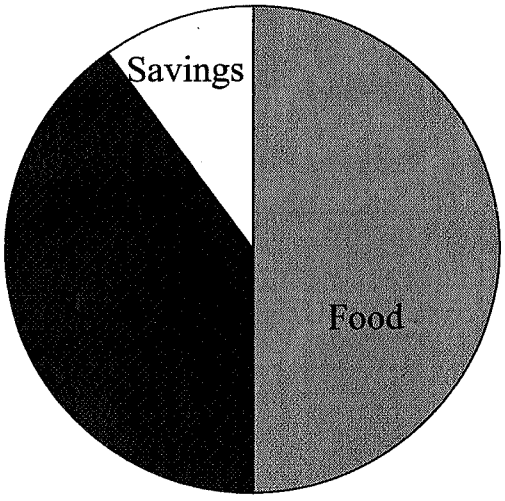
F. Divide by 10
G. Divide by 100
H. Multiply by 10
J. Multiply by 100

71. Diana wants to draw a circle graph to show how she spent her free time last weekend. She spent $\frac{1}{4}$ of her time watching TV, $\frac{1}{2}$ of the time playing lacrosse, $\frac{1}{8}$ of the time napping, and $\frac{1}{8}$ of the time talking on the phone. What should she label piece Z on the graph?



A. watching TV
B. playing lacrosse
C. napping
D. talking on the phone

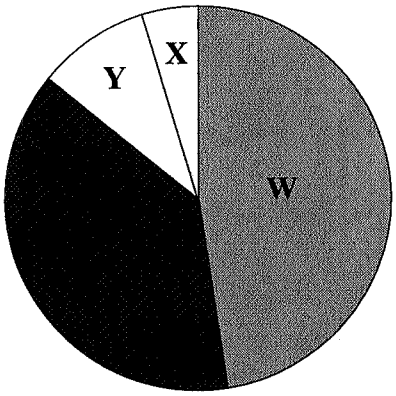
72. Manny made a graph of how he spent his money last year.



How did he spend $\frac{1}{2}$ of his money?

A. food
B. savings
C. entertainment
D. school supplies

73. Dana is drawing a circle graph showing how she spent her money at the mall. She spent $50 on clothing, $40 on sports equipment, $10 on computer software, and $5 on food. What should she label piece X of the graph?



F. clothing
G. sports equipment
H. computer software
I. food

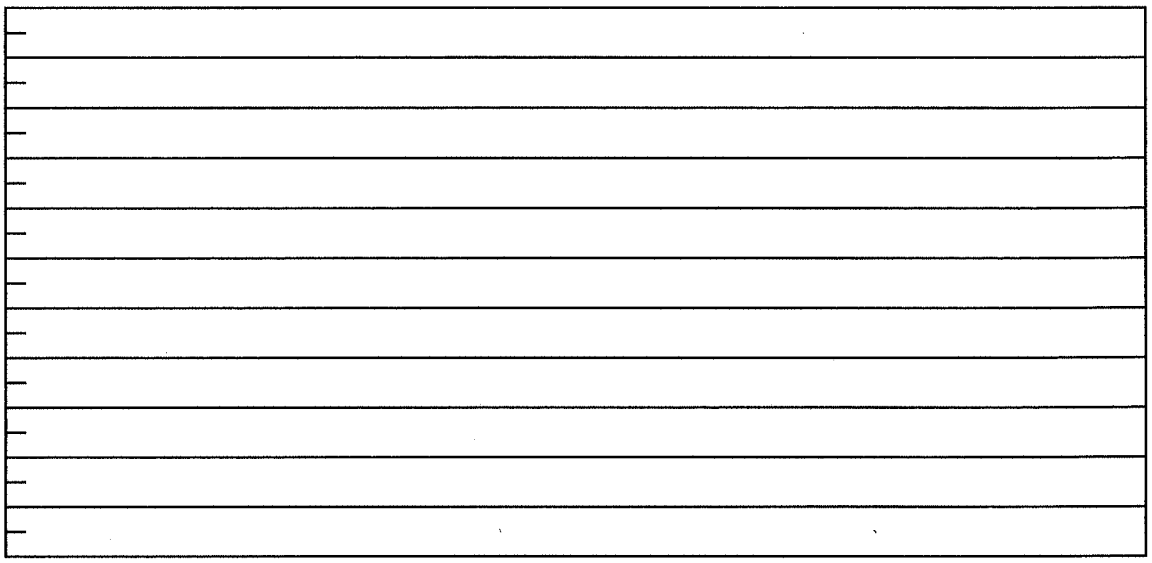
74. Danny sells kites at the Fly & Float Shop. In the first six months of the year, he sold a total of 1000 kites. Kite sales increased every month until May, and then went down in June.

Fill in the table to show how many kites Danny might have sold each month.

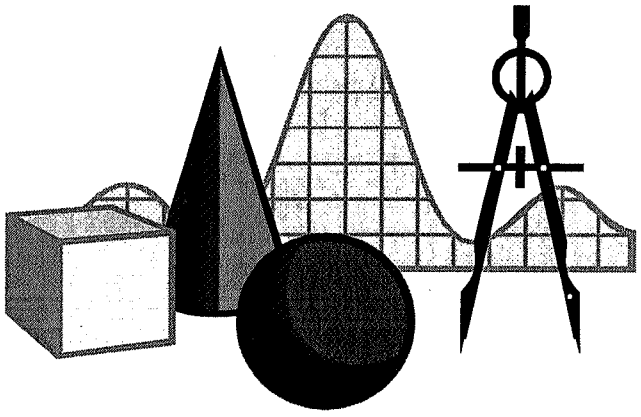
Month	**Number of Kites Sold**
January	75
February	
March	
April	200
May	
June	
Total	1000

Draw a bar graph that shows the information in the table. Your graph must be labeled and have a title.

SAMPLE *TERRANOVA* ITEMS

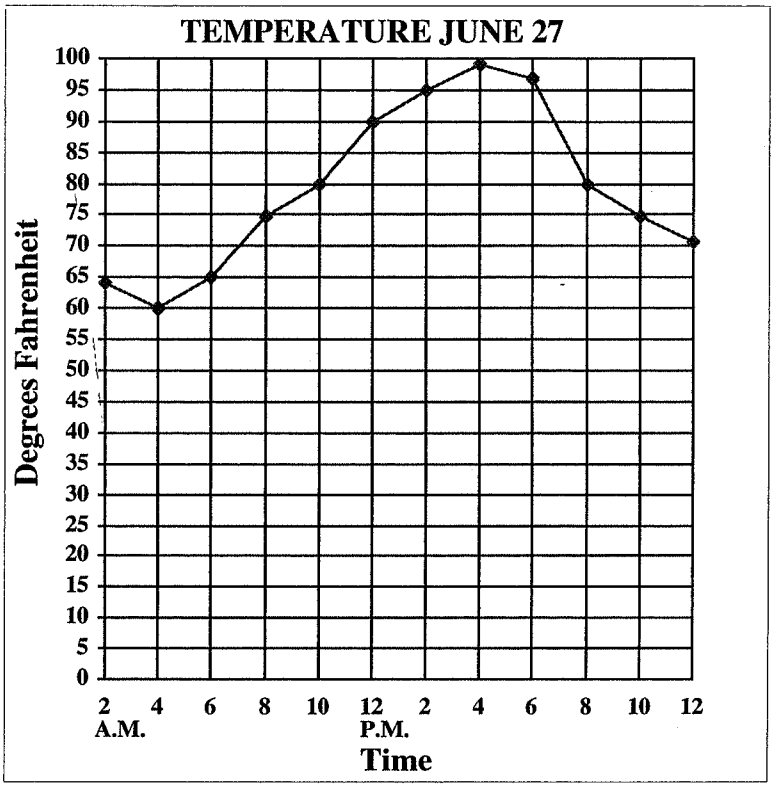


SAMPLE
HCPSS
ITEMS



SAMPLE HCPSS ITEMS

Use this line graph to answer the questions.

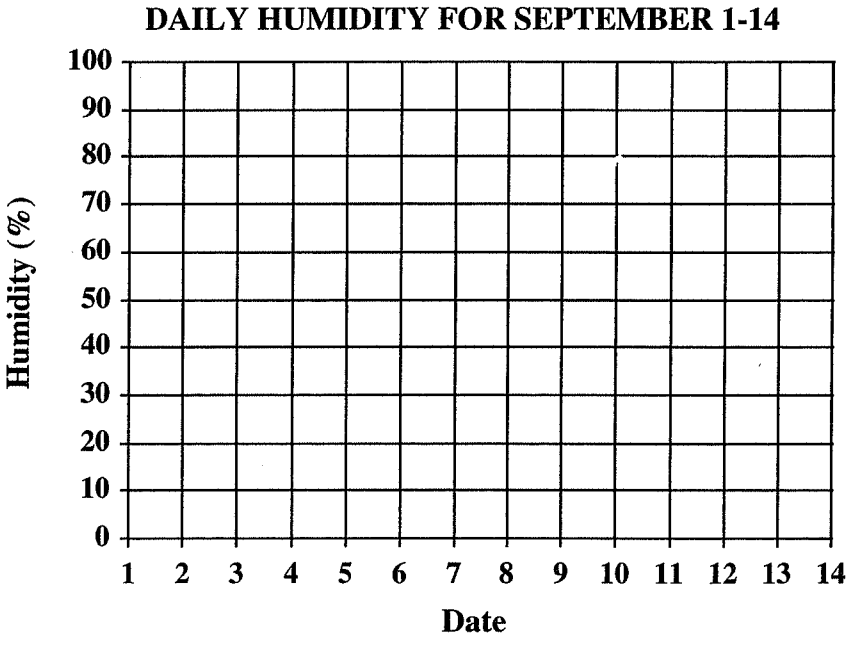


1. What unit was used to record temperature? _____
2. How often was it recorded? _ _____
3. The sun is highest at noon. Is that the hottest time of day? _____
4. What was the coolest temperature? _____
5. How many degrees did the temperature rise that day? ___ _____
6. At what time did the temperature begin to fall? _____
7. How many degrees did the temperature fall between 6 and 8 P.M.? _____
8. Is the coolest time of the day on this graph just before the sun rose? _____

---

9. Humidity is the amount of water in the air. It is written as a percent. When it is high, the air feels damp. When it is low, the air feels dry. The table below shows daily humidity for two weeks in September. Use the table to draw a line graph below.

HUMIDITY	
September	%
1	75
2	78
3	85
4	90
5	92
6	90
7	55
8	60
9	65
10	70
11	65
12	75
13	85
14	90



SAMPLE HCPSS ITEMS

Find the range, mean, median, and mode of each set of data.

	Range	Mean	Median	Mode(s)
1. 7, 5, 5, 8, 10				
2. 12, 2, 6, 2, 24, 2				
3. 7, 4, 3, 3, 4, 4, 3				
4. 17, 10, 8, 3, 25, 18, 3				
5. 13, 1, 10, 1, 1, 69, 1, 72				
6. 24, 32, 9, 7, 11, 31, 33, 91, 92				

Solve:

7. Five kinds of bread are priced at $1.84, $1.24, $1.19, $1.37, and $1.46 per loaf. What is the range of the prices?

8. What is the mean price of a loaf of bread?

9. What is the median price of a loaf of bread?

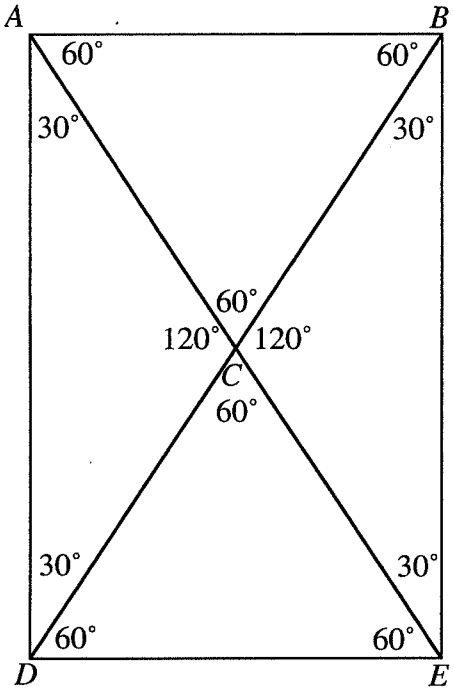
10. What is the mode of the prices?

Find all the factors of each number. Then circle each prime number.

11. 2
12. 3
13. 4
14. 5
15. 6
16. 7
17. 8
18. 9
19. 10

SAMPLE HCPSS ITEMS

Use the figure below to find the following:



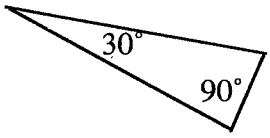
1. Name two acute triangles. _____
2. Name four right triangles. _____

   _____
3. Name two obtuse triangles. _____
4. Name two equilateral triangles. _____
5. Name two isosceles triangles. _____
6. Name four scalene triangles. _____

   _____
7. In this figure, the _____ triangles are equilateral, the right triangles are _____, and the isosceles triangles are _____.

Find the missing measure in each triangle. Then classify the triangle.

8.



_____°

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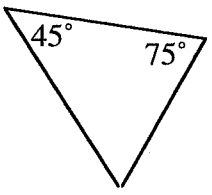
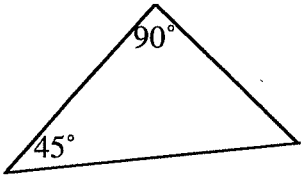
9.



_____°

_____

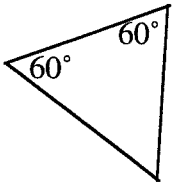
10.



_____°

_____

11.



_____°

_____

SAMPLE HCPSS ITEMS

Find the circumference of each circle. Be careful—sometimes the radius is given instead of the diameter.

1. d = 2 mi

2. d = 12 m

3. r = 4 in.

4. d = 5.6 cm

5. r = 1.75 ft

6. d = 9.3 km

Solve.

7. Mrs. Lassart sewed lace onto the edge of a round tablecloth that has a diameter of 6 feet. How much lace did she use?

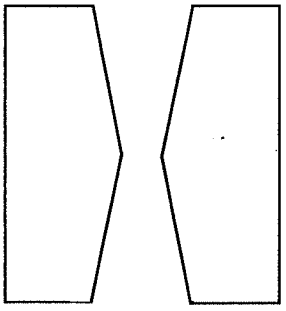
8. Alejandro's bicycle has wheels that are 28 inches in diameter. What is the circumference of one wheel?

9. The distance a wheel travels in one turn is equal to the circumference of the wheel. How far does a wheel 36 centimeters in diameter travel in one turn?

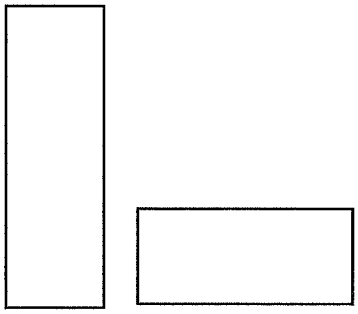
10. Harlan's model plane is flying in circles on a guide wire. If the guide wire is 40 meters long, what is the circumference of the circle in which the plane is flying?

SAMPLE HCPSS ITEMS

Look at each pair of figures. Then write *translation*, *rotation*, or *reflection* to describe the kind of change illustrated.

1. 

_____

2. 

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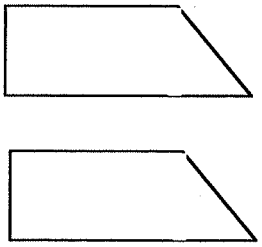
3. 

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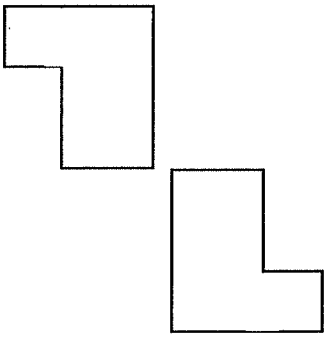
4. 

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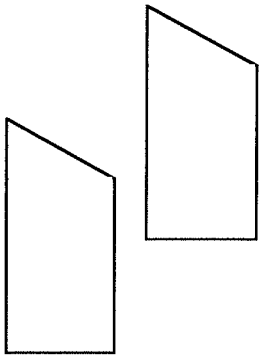
5. 

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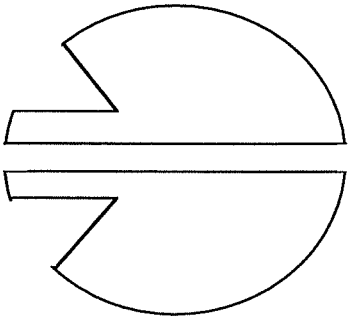
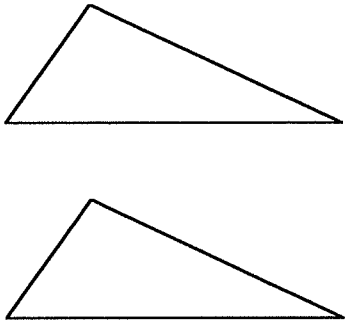
6. 

_____

7. 

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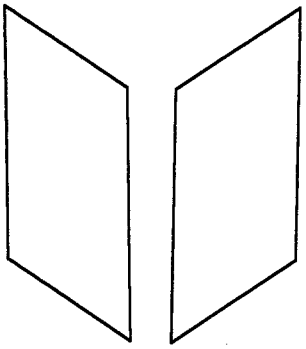
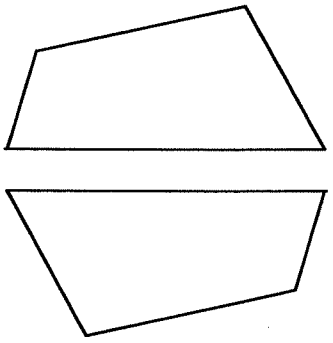
8. 

_____

9. 

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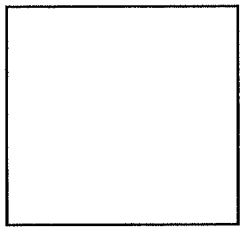
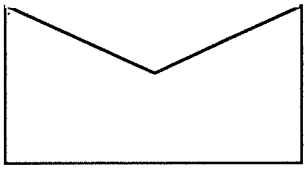
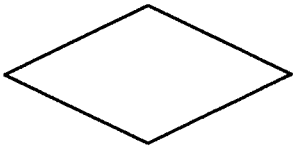
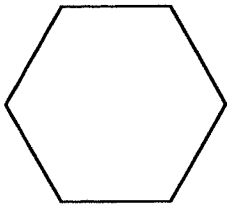
SAMPLE HCPSS ITEMS

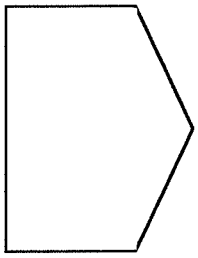
Draw as many lines of symmetry through each figure as possible.

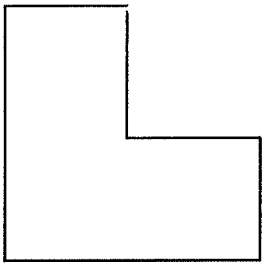
1. 

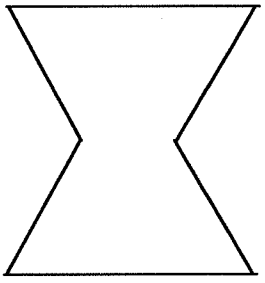
2. 

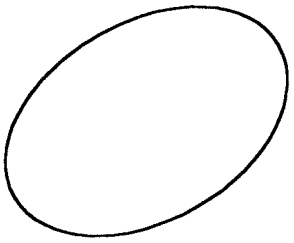
3. 

4. 

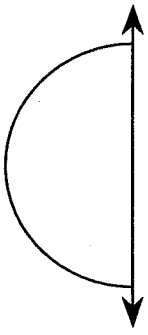
5. 

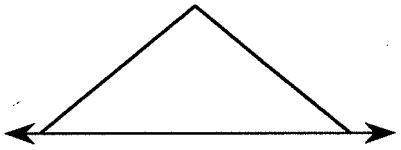
6. 

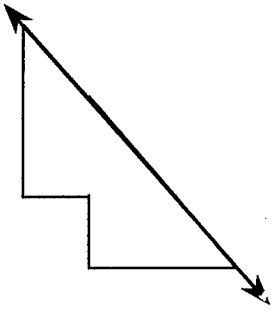
7. 

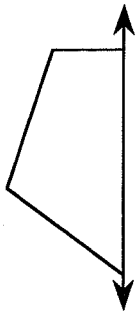
8. 

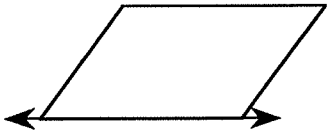
Complete each figure so the arrowed line is a line of symmetry.

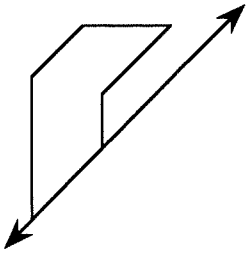
9. 

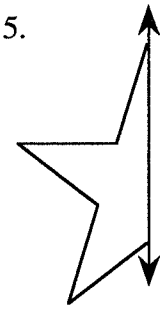
10. 

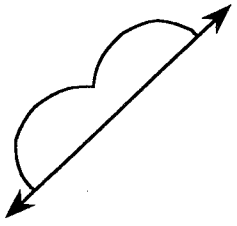
11. 

12. 

13. 

14. 

15. 

16. 

SAMPLE HCPSS ITEMS

Find each of the following:

	the first ten (or more) multiples	three common multiples	the LCM
1. 2 7			
2. 3 5			
3. 4 10			
4. 6 9			
5. 3 4 8			
6. 6 15			
7. 9 12 18			

Find the least common multiple of each set of numbers.

8. 9, 15

9. 3, 7

10. 4, 6, 9

11. 6, 8

12. 4, 7

13. 5, 6, 8

SAMPLE HCPSS ITEMS

Change each fraction to a whole number or a mixed number.

1. $\frac{7}{3}=$

2. $\frac{20}{4}=$

3. $\frac{36}{6}=$

4. $\frac{21}{8}=$

5. $\frac{29}{4}=$

6. $\frac{25}{12}=$

7. Maureen bought $\frac{5}{3}$ (or _____) dozen doughnuts.

8. We walked $\frac{53}{10}$ (or _____) miles in a charity walkathon.

Change each mixed number to a fraction.

9. $2\frac{1}{2}=$

10. $1\frac{2}{3}=$

11. $1\frac{3}{8}=$

12. $2\frac{1}{6}=$

13. $3\frac{7}{9}=$

14. $5\frac{1}{4}=$

15. The Enriquez family drinks $3\frac{1}{4}$ (or _____) quarts of milk each day.

16. Benjamin filled the gas tank with $7\frac{4}{5}$ (or _____) gallons of gasoline.

SAMPLE HCPSS ITEMS

Add. Write each sum in lowest terms.

1. $\frac{2}{9}+\frac{4}{9}=\frac{\quad}{9}=\frac{\quad}{3}$

2. $\frac{4}{7}+\frac{1}{7}=$

3. $\frac{1}{12}+\frac{7}{12}=$

4. $\frac{1}{10}+\frac{3}{10}+\frac{4}{10}=$

Add. Use the least common denominator. Write each sum in lowest terms.

5. $\begin{array}{r} \frac{3}{8} \\ +\frac{1}{12} \\ \hline \end{array}$

6. $\begin{array}{r} \frac{1}{4} \\ +\frac{1}{2} \\ \hline \end{array}$

7. $\begin{array}{r} \frac{1}{3} \\ +\frac{5}{12} \\ \hline \end{array}$

8. $\begin{array}{r} \frac{5}{8} \\ +\frac{1}{6} \\ \hline \end{array}$

9. $\begin{array}{r} \frac{4}{7} \\ +\frac{1}{4} \\ \hline \end{array}$

10. $\begin{array}{r} \frac{5}{6} \\ +\frac{1}{10} \\ \hline \end{array}$

11. Owen grew $\frac{5}{16}$ of an inch this year and $\frac{3}{8}$ of an inch last year. How much did he grow in two years?

12. The family ate $\frac{5}{16}$ of a gallon of vanilla ice cream and $\frac{3}{8}$ of a gallon of chocolate ice cream. How much was eaten in all?

SAMPLE HCPSS ITEMS

Subtract. Write each difference in lowest terms.

1. $\frac{7}{8} - \frac{3}{8} = \frac{\quad}{8} = \frac{\quad}{2}$

2. $\frac{5}{9} - \frac{1}{9} =$

3. $\frac{11}{20} - \frac{7}{20} =$

4. $\frac{13}{16} - \frac{3}{16} =$

Subtract. Use the least common denominator. Write each difference in lowest terms.

5. $\begin{array}{r} \frac{5}{8} \\ -\frac{1}{6} \\ \hline \end{array}$

6. $\begin{array}{r} \frac{1}{2} \\ -\frac{3}{10} \\ \hline \end{array}$

7. $\begin{array}{r} \frac{5}{6} \\ -\frac{1}{4} \\ \hline \end{array}$

8. $\begin{array}{r} \frac{8}{9} \\ -\frac{2}{6} \\ \hline \end{array}$

9. $\begin{array}{r} \frac{4}{5} \\ -\frac{3}{4} \\ \hline \end{array}$

10. $\begin{array}{r} \frac{6}{7} \\ -\frac{1}{3} \\ \hline \end{array}$

11. Jennie wants to loosen a $\frac{9}{16}$-inch bolt. Is her $\frac{1}{2}$-inch wrench too big or too small? By how much?

12. Dirk must fit a $\frac{7}{8}$-inch piece of door trim into a $\frac{5}{6}$-inch space. How much must he shave off the door trim?

SAMPLE HCPSS ITEMS

Round each number below to the –

	nearest whole number	nearest tenth	nearest hundredth
1. 38.1954			
2. 27.0368			
3. 49.7625			
4. 15.9043			
5. 60.4507			
6. 53.2879			

Round each decimal to the nearest tenth and estimate the answer. Then compare the estimated answer with the exact answer. ***Watch the signs!***

7. $\begin{array}{r} 8.371 \\ -0.6 \\ \hline \end{array}$ about _____

8. $\begin{array}{r} 17.05 \\ +4.938 \\ \hline \end{array}$ about _____

9. $\begin{array}{r} 40.16 \\ -28.21 \\ \hline \end{array}$ about _____

SAMPLE HCPSS ITEMS

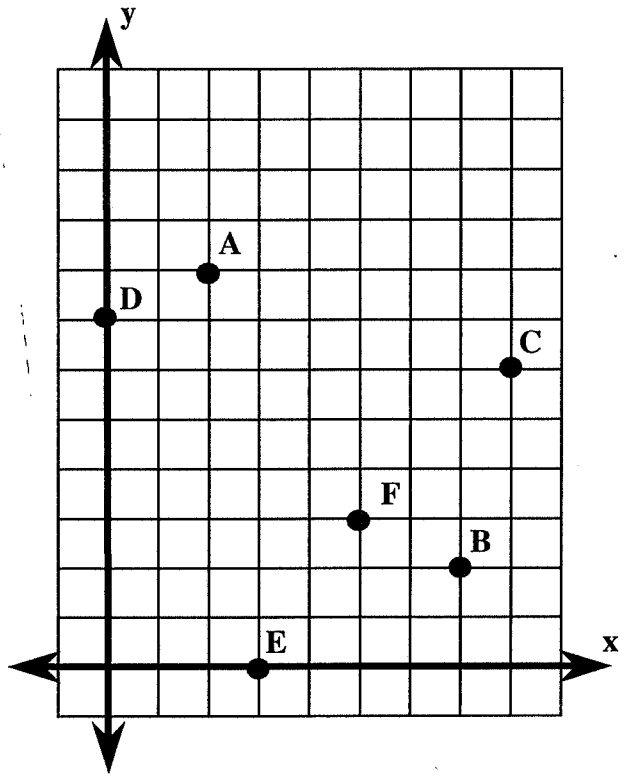
Make a tree diagram to solve each problem.

1. Esmeralda is an author. In the morning, she either writes or does research. In the afternoon, she either edits, proofreads, or answers letters. In how many ways could Esmeralda spend her day?

2. William wants to start an exercise program with two activities. During the week, he could run or bike. On weekends, he could play baseball, basketball, or volleyball. How many possible exercise programs could William set up?

3. Shannon is dressing for work. She could wear a black suit or a white suit. Her blouse could be pink or blue. Her shoes could be black, white, or pink. How many possible outfits could Shannon make?

Name the point for each ordered pair.



1. (7, 2) _____
2. (5, 3) _____
3. (8, 6) _____
4. (3, 0) _____
5. (2, 8) _____
6. (0, 7) _____

SAMPLE HCPSS ITEMS

Find the area of each figure.

1. a rectangle, l = 9 m
   w = 7 m

2. a parallelogram;
   b = 12 cm, h = 4 cm

3. a parallelogram;
   b = 10 yd, h = 10 yd

4. a rectangle; l = 25 in.,
   w = 8 in.

Solve. You can draw a picture to help you.

5. The Mayers built a square deck with an area of 81 square feet. What was the length of a side?

6. A field in the shape of a parallelogram has a base of 500 meters and a height of 100 meters. What is the area of the field?

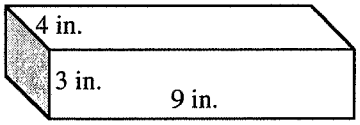
7. A photograph has an area of 150 square centimeters. If the width is 10 centimeters, what is its length?

8. A can of paint covers 500 square feet. Is it enough to paint a wall that is 8 feet wide and 14 feet long?

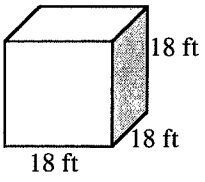
SAMPLE HCPSS ITEMS

Find the volume of each figure. Remember to write volume in cubic units.

1.



2.



3. l = 100 m, w = 40 m, h = 30 m

4. l = 0.7 yd, w = 0.6 yd, h = 1.1 yd

Solve. Each figure is a rectangle prism.

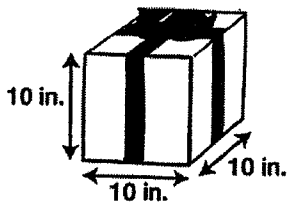
5. Hunting fossils, scientists dug a hole 35 meters long, 10 meters wide, and 2.5 meters deep. How many cubic meters of dirt did they remove?

6. Hallie's package had a volume of 10,000 cubic centimeters. It was 20 centimeters high and 10 centimeters wide. How long was it?

SAMPLE HCPSS ITEMS

Find the surface area of each object below. Remember to show area in square units.

1.



front = _____

back = _____

top = _____

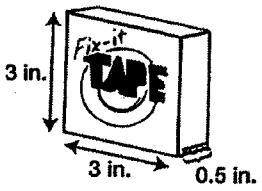
bottom = _____

side = _____

side = _____

S. A. = _____

2.



front = _____

back = _____

top = _____

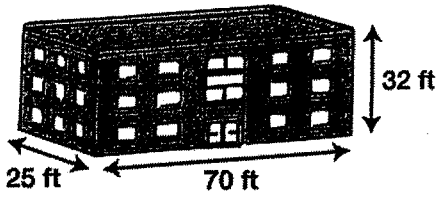
bottom = _____

side = _____

side = _____

S. A. = _____

3.



front = _____

back = _____

top = _____

bottom = _____

side = _____

side = _____

S. A. = _____

SAMPLE HCPSS ITEMS

Write the indicated ratio for each set of terms. Use the fractional form.

TERMS	RATIO	
1. 15 sit-ups in 60 seconds	sit-ups to seconds	_____
2. 15-foot length and 10-foot width	length to width	_____
3. $1.05 for 5 cans	cans to dollars	_____
4. 3 tables for 12 people	people to tables	_____

Equal ratios are like equivalent fractions and are found the same way. Multiply or divide both terms by the same number. For example, to find the number of worms Jeff used per fish, divide: $\frac{12}{2} \div \frac{2}{2} = \frac{6}{1}$ that is, 6 worms for every fish caught.

Complete each chart with equal ratios.

5.

hits	3	6	9	12	15
at bats	10				

6.

cans of beans	4	2	1	6	10
dollars	$1.00				

7.

seeds planted	10	30	20	50	100
seeds sprouted	6				

8.

pages read	2	6	4	10	20
Minutes	5				

SAMPLE HCPSS ITEMS

Find the percent of each number below.

1. 76% of 175

2. 25% of 240

3. 9% of 350

4. 81% of 200

5. 17% of 160

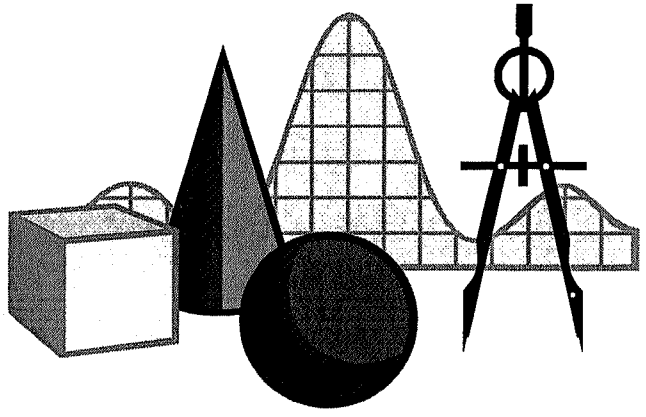
6. 20% of 550

Solve.

7. Stock worth $72.50 per share increased by 2% one day. What was the dollar value of the increase?

8. Mr. Duong had $18,500 in a retirement fund. Its value rose 12% last year. How much was the increase? How much is in the fund now?

ANSWERS



ANSWERS

MFMT

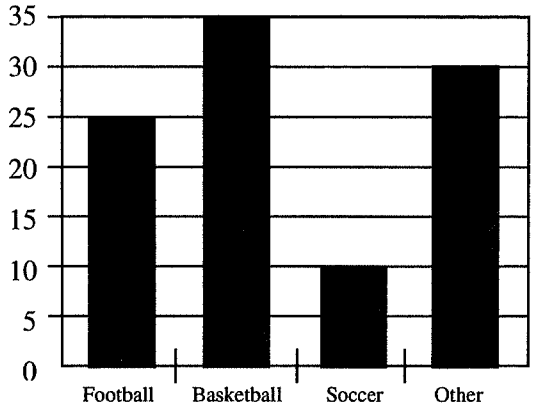
1. C
2. D
3. D
4. B
5. A
6. A
7. C
8. A
9. D
10. B
11. C
12. C
13. B
14. C
15. C
16. B
17. B
18. A
19. D
20. C
21. B
22. B
23. A
24. C
25. A
26. C
27. B
28. D
29. B
30. D

TERRANOVA

1. A
2. C
3. G
4. D
5. A
6. B
7. A
8. G
9. C
10. C
11. G
12. C
13. G
14. D
15. F
16. D
17. D
18. C
19. J
20. D
21. G
22. G
23. C
24. H
25. D
26. F
27. C
28. G
29. B
30. H
31. D
32. G
33. B

34. For example:

FAVORITE SPORTS



FAVORITE SPORTS

Football	• • • • •
Basketball	• • • • • • •
Soccer	• •
Other	• • • • • •

Key: 1 ball • = 5 students

35. H
36. H
37. H
38. D
39. D
40. G
41. C
42. H
43. C
44. C
45. B
46. First, add the weights of the 3 bottles. Then convert the 2 pounds on the scale to 32 ounces. Subtract the weight of the paint from the total weight; 32-30 = 2. Divide by 2 to get the weight of one paintbrush. One paintbrush weighs 1 ounce.

TERRANOVA (Continued)

34. F
35. B
36. F
37. J
38. B
39. G
40. C
41. F
42. B
43. C
44. A
45. D
46. A
47. H
48. C
49. B
50. C
51. C
52. D
53. G
54. C
55. J
56. C
57. F
58. A
59. A
60. J

74.

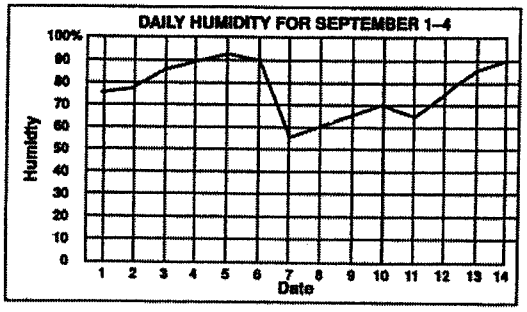
Month	Number of Kites Sold
January	75
February	**100**
March	**150**
April	200
May	**300**
June	**175**
Total	1000

ANSWERS

HCPSS PRACTICE QUESTIONS

Page 39

1. degrees Fahrenheit
2. every two hours
3. no
4. 60°F
5. about 38°F
6. between 4 p.m. and 6 p.m.
7. about 18°F
8. yes



Page 40

1.	5	7	7	5
2.	22	8	4	2
3.	4	4	4	3, 4
4.	22	12	10	3
5.	71	21	5.5	1
6.	85	36.6	31	none

7. $.65
8. $1.42
9. $1.37
10. There is no mode.
11. 1, 2 prime
12. 1, 3 prime
13. 1, 2, 4
14. 1, 5 prime
15. 1, 2, 3, 6
16. 1, 7 prime
17. 1, 2, 4, 8
18. 1, 3, 9
19. 1, 2, 5, 10

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Answers will vary. Examples follow:

1. ΔABC, ΔDCE
2. ΔABE, ΔBED, ΔEDA, ΔDAB
3. ΔBCE, ΔACD
4. ΔACB, ΔDCE
5. ΔBCE, ΔACD
6. ΔABE, ΔBED, ΔEDA, ΔDAB
7. acute, scalene, obtuse
8. 60° right, scalene
9. 60° acute, scalene
10. 45° right, isosceles
11. 60° acute, equilateral

Page 42

1. 6.28 mi
2. 37.68 m
3. 25.12 in
4. 17.584 cm
5. 10.99 ft
6. 29.202 km
7. 18.84 feet
8. 87.92 inches
9. 113.04 centimeters
10. 251.2 meters

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1. reflection
2. rotation
3. translation
4. rotation
5. translation
6. reflection
7. translation
8. reflection
9. rotation

ANSWERS

HCPSS PRACTICE QUESTIONS (Continued)

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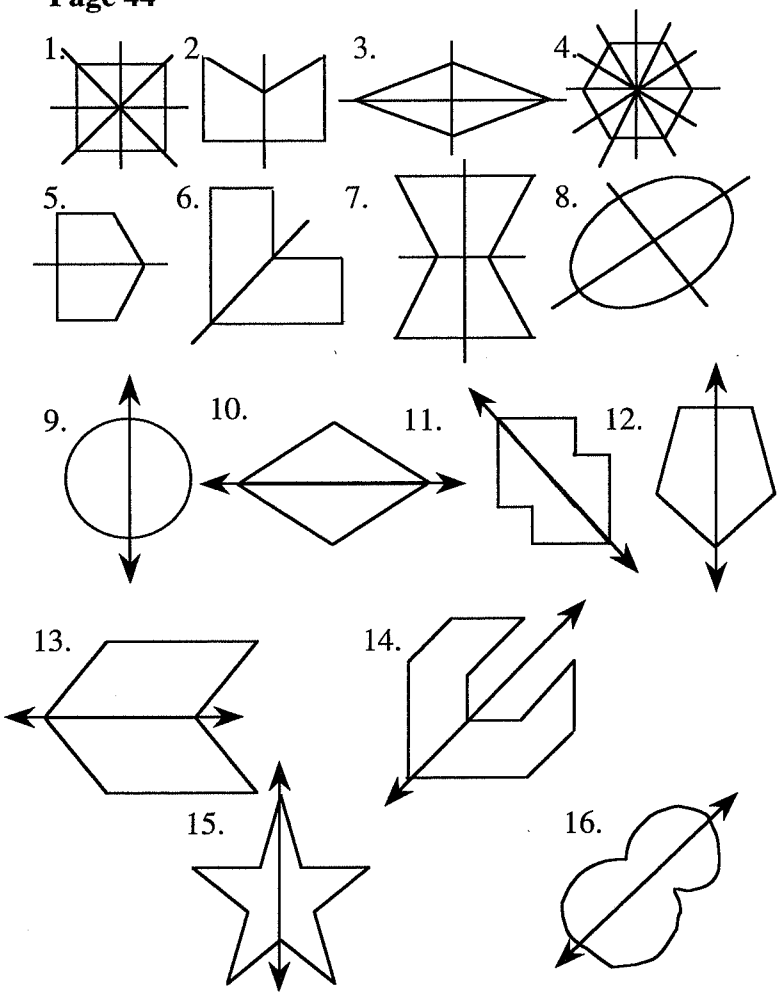

Page 45

1. 2,4,6,8,10,12,14,16,18,20 7,14,21,28,35,42,49,56,63,70	14,28,42	14
2. 3,6,9,12,15,18,21,24,27,30 5,10,15,20,25,30,35,40,45,50	15,30,45	15
3. 4,8,12,16,20,24,28,32,36,40 10,20,30,40,50,60,70,80,90,100	20,40,60	20
4. 6,12,18,24,30,36,42,48,54,60 9,18,27,36,45,54,63,72,81,90	18,36,54	18
5. 3,6,9,12,15,18,21,24,27,30 4,8,12,16,20,24,28,32,36,40 8,16,24,32,40,48,56,64,72,80	28,48,72	24
6. 6,12,18,24,30,36,42,48,54,60 15,30,45,60,75,90,105,120,135,150	30,60,90	30
7. 9,18,27,36,45,54,63,72,81,90 12,24,36,48,60,72,84,96,108,120 18,36,54,72,90,108,126,144,162,180	36,72,108	36

8. 45
9. 21
10. 36
11. 24
12. 28
13. 120

Page 46

1. $2\frac{1}{3}$
2. 5
3. 6
4. $2\frac{5}{8}$
5. $7\frac{1}{4}$
6. $2\frac{1}{12}$
7. $7\frac{1}{4}$
8. $5\frac{3}{10}$
9. $\frac{5}{2}$
10. $\frac{5}{3}$
11. $\frac{11}{8}$
12. $\frac{13}{6}$
13. $\frac{34}{9}$
14. $\frac{21}{4}$
15. $\frac{13}{4}$
16. $\frac{39}{5}$

Page 47

1. 6 2
2. $\frac{5}{7}$
3. $\frac{2}{3}$
4. $\frac{4}{5}$
5. $\frac{11}{24}$
6. $\frac{3}{4}$
7. $\frac{3}{4}$
8. $\frac{19}{24}$
9. $\frac{23}{28}$
10. $\frac{14}{15}$
11. $\frac{11}{16}$ of an inch
12. $\frac{11}{12}$ of a gallon

Page 48

1. 4 1
2. $\frac{4}{9}$
3. $\frac{1}{5}$
4. $\frac{5}{8}$
5. $\frac{11}{24}$
6. $\frac{1}{5}$
7. $\frac{7}{12}$
8. $\frac{5}{9}$
9. $\frac{1}{20}$
10. $\frac{11}{21}$
11. $\frac{1}{16}$ inch too small
12. $\frac{1}{24}$ inch

ANSWERS

HCPSS PRACTICE QUESTIONS (Continued)

Page 49

1. 38 38.2 38.20
2. 27 27.0 27.04
3. 50 49.8 49.76
4. 16 15.9 15.90
5. 60 60.5 60.45
6. 53 53.3 53.29
7. 7.771 7.8
8. 21.988 22.0
9. 11.95 12.0

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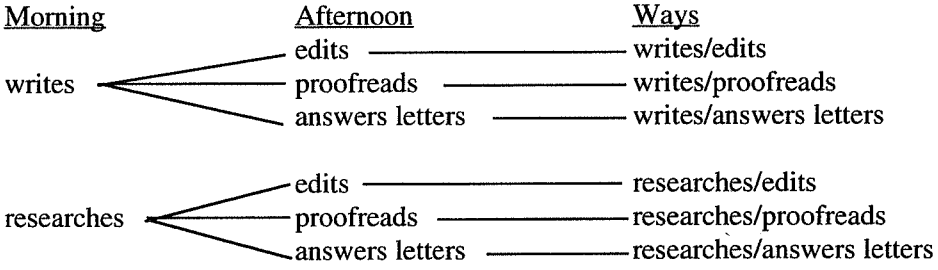
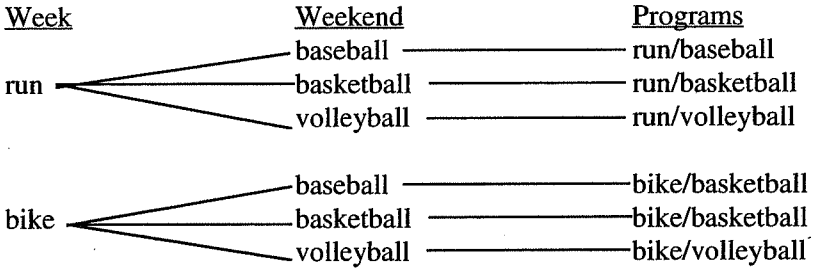
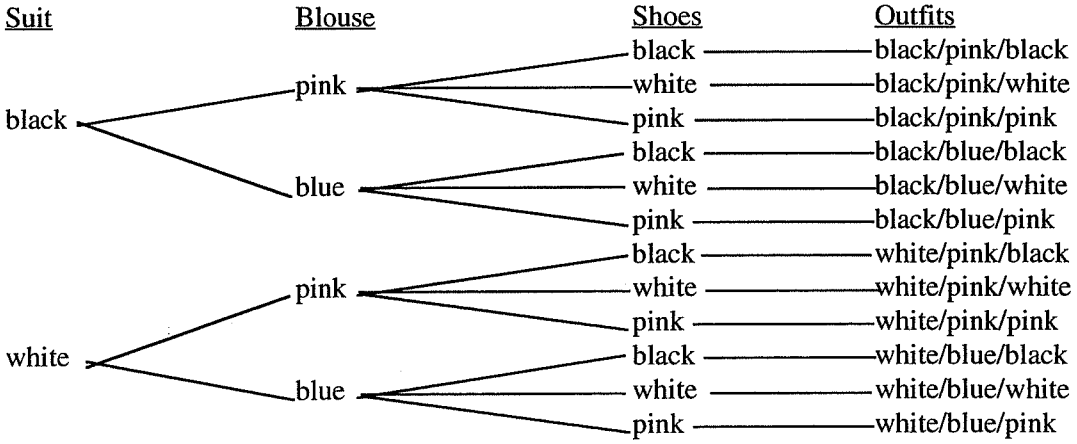
1. 6 ways



2. 6 possible exercise programs



3. 12 possible outfits



ANSWERS

HCPSS PRACTICE QUESTIONS (Continued)

Page 51

1. B
2. F
3. C
4. E
5. A
6. D

Page 52

1. 63 m^2
2. 48 cm^2
3. 100 yd^2
4. 200 in^2
5. 9 feet
6. 50,000 m^2
7. 15 centimeters
10. yes

Page 53

1. 108 in^3
2. 5,832 ft^3
3. 120,000 m^3
4. 0.462 yd^3
5. 875 cubic meters
6. 50 centimeters

Page 54

1.	2.	3.
100 in^2	9 in^2	2,240 ft^2
100 in^2	9 in^2	2,240 ft^2
100 in^2	1.5 in^2	1,750 ft^2
100 in^2	1.5 in^2	1,750 ft^2
100 in^2	1.5 in^2	800 ft^2
100 in^2	1.5 in^2	800 ft^2
600 in^2	24 in^2	9,580 ft^2

Page 55

1. $\frac{15}{60}$
2. $\frac{15}{10}$
3. $\frac{5}{\$1.05}$
4. $\frac{12}{3}$

5.	20	30	40	50
6.	$.50	$.25	$1.50	$2.50
7.	18	12	30	60
8.	15	10	25	50

Page 56

1. 133
2. 60
3. 31.5
4. 162
5. 27.2
6. 110
7. $1.45
8. $2,220 increase, $20,720