

Review Materials: Mathematics for Elementary Teachers

Research on teacher effectiveness indicates that teaching subjects such as mathematics, social studies and science requires that teachers have a sound understanding of the content they teach. These materials will help you review mathematical concepts and related terminology, skills and problem solving related to key topics in the K-8 curriculum. The review will help you to be better prepared to teach math in your field placement this term.

The materials are organized by content strands with subtopics listed for each strand. These strands are similar to those in New York City and New York State Core Math curriculum and national guidelines such as [Standards and Principles for School Mathematics](#) (2000) by the National Council of Teachers of Mathematics which have five content strands: Number and Operations, Geometry and Spatial Sense, Measurement, Data Interpretation and Probability, and Algebra and Patterns. Review exercises are given for each subtopic. Some have examples. Answers are given, sometimes with step-by-step solutions.

The review includes various types of questions – multiple-choice, short answer, or long-answer. Some are straightforward. Others involve several steps and/or ask you to explain your solution, as often required by questions on high-stakes exams, such as New York State Math tests (grades 4 – 8). Doing these review problems will also help you experience the types of questions which students are expected to answer.

Whole Number

- W1 compute with whole numbers, order of operations
- W2 apply operations on whole numbers to solve problems
- W3 find place value of digits in whole numbers to 10-places
- W4 find multiples of a number, common multiples and least common multiple
- W5 find divisors of a number, common divisors, and greatest common divisor
- W6 write a number as an expanded numeral and in exponential format
- W7 determine whether a number is odd/even, prime/composite
- W8 estimate amounts and answers to computations, round to the nearest ten, hundred, thousand

Fractions

- F1 represent a fraction by a diagram, real-world situation, on the number line
- F2 find equivalent fractions, simplify fractions (reduce to lowest terms)
- F3 compare two fractions, order a set of fractions
- F4 express an improper fraction as a mixed numeral and vice versa, represent mixed numerals
- F5 compute with fractions, estimate answers for computations with fractions
- F6 test if a fraction is a solution to an equation or inequality
- F7 apply operations on fractions to solve problems

Decimals

- D1 represent a decimal by a diagram, on a number line, or real-world situation
- D2 represent a fraction as a decimal and vice versa
- D3 find place value of digits in a decimal, compare decimals, order a set of decimals
- D4 compute with decimals, estimate answers for computations with decimals
- D5 test if a decimal is a solution to an equation or inequality
- D6 apply operations on decimals to solve problems
- D7 approximate the square root of a whole number by a whole number or decimal with and without a calculator

Ratio and Percent, and Proportions

- P1 represent a percent by a diagram, fraction, decimal
- P2 compute percentages and apply them to solve problems, compute percentages using a calculator
- P3 represent a ratio by a diagram or fraction, solve ratio problems
- P4 similar figures and proportions

Measurement

- M1 estimate and measure with a ruler length in metric system and English system units
- M2 find the perimeter and area of plane figures, and volume of 3-dimensional figures
- M3 solve problems involving perimeter, area, and volume
- M4 estimate and measure angles in degrees, identify right, acute, and obtuse angles

Geometry

- G1 identify parallel and perpendicular lines, congruent figures, line of symmetry of a figure
- G2 identify shapes by their properties, draw shapes given certain properties
- G3 identify 3-dimensional shapes and tell their properties
- G4 [Similar Triangle, Properties of Proportions, and Indirect measurement](#)

Data Interpretation and Probability

- S1 interpret graphs (bar, line, pictograph, circle, double bar), construct graphs given data
- S2 find an average and solve problems involving averages
- S3 find range, median, mean of a set of data
- S4 determine combinations, and represent them by a list or a tree diagram
- S5 find the probability of simple events, estimate empirical probability given data

Patterns and Algebra

- A1 use variables to describe quantitative situations and diagrams
- A2 compute with positive and negative integers
- A3 evaluate expressions or formula involving variables
- A4 check if a number is a solution to an equation or inequality, solve equations/inequalities
- A5 find rule for patterns or IN-OUT functions
- A6 use equations to represent real-world situations
- A7 graph equations for lines and inequalities in the x-y coordinate plane

Review Exercises

WHOLE NUMBERS

W1 A) Compute:


- a) the product of 31 and 13 b) the sum of 3672 and 18 c) the difference of 31 and 13 d) the quotient of 3672 and 18
e) the product of two numbers is 24. Their sum is 10. What is the difference of the two numbers?

B) Compute using the rules for order of operations

$$A = 3 \times 4 + 5 \quad B = 3 \times (4+5) \quad C = 3 + 4 \times 10 \div 5 \quad D = 3 \times 4 + 3 \times 5 \quad E = 44 \div 4 + (4 \times 4 - 4) \quad F = 5 \times 3 - 12 + 2^3$$

C) Which methods for “thinking out computation” (i.e., mental arithmetic) are correct?

- a) $7 + 8$ Think: 7 plus 7 is 14, plus 1 more is 15
b) $38 - 17$ Think: 38 minus 10 is 28, minus 7 more is 21
c) 999×3 Think: 1000 threes is 3000 minus 1 three is 2997
d) $150 \div 3$ Think: what equals 150×3 , that's 450

W2 A) Jim drives 384 miles in his Subaru and uses 12 gallons of gas. How many miles per gallon did his car get for this trip? 

- B) Manny bought six box seat and four upper grandstand tickets for the Mets game against the San Francisco Giants. If box seats cost \$29 and grandstand cost \$17, how much did the 10 tickets cost?
- C) A box contains 60 oranges. Oranges cost 10 cents each. How many oranges can be shipped in a railroad car that holds 2500 boxes?
- D) NJ Nets guard Jason Kidd, scored 34 points more than the NY Knicks rookie guard. The rookie scored 8 points fewer than his teammate, Stephan Marbury, who scored 15 points. How many points did Jason Kidd score?
- E) Charlie Brown and Lucy see 10 animals at the Bronx Zoo. Some are ostriches, others elephants. They count 14 legs on the ostriches. How many elephants did they see?
- F) The sum of two numbers is 12. Their product is 32. What are they?
- G) June buys six pieces of fruit. She spends 95 cents. She buys some of each type. What could she have bought? Find two different solutions.

FRUIT FOR SALE	
Oranges	20¢
Apple	10¢
Banana	15¢

W3 A) State the place value of the digits in \$9,078,365,432.

- a) digit 8 b) digit 4 c) digit 0 d) digit 9
e) The sum of the digits of a 3-digit number is 16. It's less than 300, and the ten's digit is 2 more than the one's digit. What is it?

B) State the value of digit “4” in this number \$4,756,890
If you add 2 and one half million dollars to this number, what is the digit in the millions place?

W4 A) Which are multiples of 6: 24, 42, 62, 600, 1,234?

- B) List multiples of 3 and multiples of 4.
C) List the first three common multiples of 3 and 4.
D) What is the LCM (Least Common Multiple) of 3 and 4?
E) Find the least common multiple of 12 and 18.
F) The LCM of 12 and a number X is 60. What is X?

W5 A) List the six divisors of 12.

B) What is the least common divisor of 12 and 18? What is the greatest common divisor?

W6 A) Write as a number and also in words: $3 \times 10^3 + 2 \times 10^2 + 0 \times 10^1 + 4 \times 10^0$

B) Express 12,345,678 in exponential form as in A)

W7 A) Which are NOT primes? Explain. 2, 6, 13, 31, 15, 51, 151

B) Sometimes true, always true, never true. Explain for each.

i) The sum of any two odd numbers is odd

ii) The product of two odds is odd

iii) The sum of two primes is a prime

iv) The product of two primes is a prime

W8 A) Round to the nearest hundred: \$1,534 and \$48,390. Round each to the nearest thousand.

B) Round first and then mentally estimate the closest answer. $396 \times \$9.95 =$ about.....

(a) \$4000 (b) \$390 (c) \$40,000 (d) \$39,000 (e) \$3,600

C) Round first and then estimate this sum: $815 + 201 + 338 + 490$

(a) 1700 (b) 1800 (c) 1900 (d) 2000

D) Estimate this quotient: $197 \overline{)801}$ (a) 800 (b) 40 (c) 4 (d) 2 (e) 8

E) Andrew was just learning how to print the letter A. He liked to print it over and over again. About how many letter A's the size of the one to the right could he print on this page? Select one of these estimates, then figure out which estimate is the best. Explain your method.

(a) 100 (b) 400 (c) 600 (d) 1,000 (e) 2,000



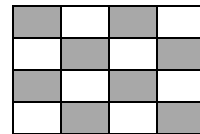
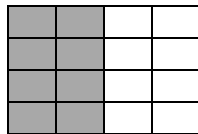
F) Guess how many seconds there are in one day. Pick one of these choices.

(a) 5,000 (b) 10,000 (c) 50,000 (d) 100,000 (e) 1 million

Then figure out about how many seconds there are. Was your guess close?

FRACTIONS

F1 A) What fraction of the rectangle is shaded?



What fraction of the circle is shaded?

B) Shade in $4/6$ of the bar.


Which is larger: $4/6$ or $1/2$?



C) Approximately what fraction of the bar is shaded?

(a) $1/4$ (b) $1/3$ (c) $1/2$ (d) $2/3$ (e) $4/5$



D) If  is $2/5$, draw a bar to show the whole, 1.

F2 A) Circle all fractions that are equivalent to $4/5$. $10/12$ $8/10$ $40/50$ $5/6$ $52/65$

B) Which fraction is in simplified form?

(a) $38/28$ (b) $36/48$ (c) $9/14$ (d) $26/39$ (e) $2/200$

C) $X/12$ reduced to lowest terms. What could X be? (a) 2 (b) 3 (c) 4 (d) 5 (e) 6

D) Simplify $36/48$ to lowest terms and determine if it is equivalent to $6/8$.

E) Tell why $17/51$ is not reduced to lowest terms. What fraction does it equal in simplified form? Give two other fractions that are equivalent to it.

F) Is $3/4$ equivalent to $15/20$? Which can you imagine more easily: $3/4$ or $15/20$? Why?

Which makes more sense to you: "simplify a fraction" or "reduce to lowest terms"? Why?

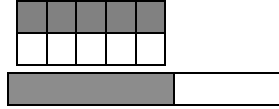
F3 A) Which fraction is larger than $1/2$? $1/10$ $40/100$ $7/9$ $7/19$

B) The fraction $X/10$ is smaller than $1/2$. What whole number values can X have?

C) Find equivalent fractions with the same denominator for $5/8$ and $3/5$ and then determine which is larger.

DECIMALS

D1 A) Write a decimal for the part of the rectangle that is shaded.

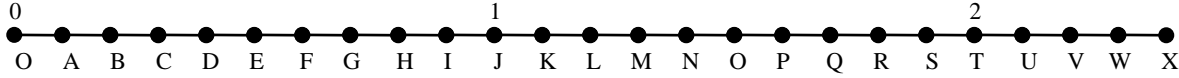


B) Which is the best estimate for the how much of the box is shaded? Why?

- (a) .48 (b) .62 (c) .81 (d) .93

C) Find the letters that correspond to these decimals and fractions.

.6 _____ $\frac{4}{10}$ _____ 1.5 _____ 0.1 _____ 1.7 _____



D) What letters on the number line above best match these decimals?

.42 _____ 0.09 _____ 1.91 _____ 1.599 _____ .40099 _____

D2 A) Write as decimals and also write in words: $\frac{4}{10}$ $\frac{32}{1000}$ $5 \frac{32}{100}$ $\frac{13}{10000}$

B) Write as a fraction: .75 .005 .875

C) Write as a fraction reduced to lowest terms: .20 .375 2.5

D) Write as a decimals: $\frac{4}{5}$ $\frac{15}{20}$ $\frac{42}{50}$ $\frac{42}{500}$

E) Use a calculator. Write as repeating decimals: $\frac{2}{3}$ $\frac{7}{9}$ $\frac{12}{99}$ $\frac{1}{7}$ $\frac{36}{99}$

F) What pattern do you notice in changing fractions of the form $\frac{XY}{99}$ (eg., $\frac{12}{99}$) to a decimal? Explain.

D3 A) What is the place value of these digits in the decimal: 123.456709

digit 5: _____ digit 6: _____ digit 2: _____ digit 9: _____

B) Round to the nearest tenth: 0.18 _____ 3.79 _____ 23.092 _____

C) Round to the nearest hundredth: .908 _____ 3.792 _____ 23.0978 _____

D) Which decimal is smaller? .05 or .1 .123 or .08 .19 or 1.2 .04 or .200

E) Order these decimals from smallest to largest.

.6 .34 1.2 .012 1.0000 .09 1.01

D4 A) Compute (if possible, in your head; check with a calculator if you wish).

(a) $.3 + .6 =$ (b) $.34 + .51 =$ (c) $.882 - .007 =$ (d) $.34 + .7 =$ (e) $4.84 - 1.2 =$ (f) $.3 \times .2 =$

(g) $4 \times .5 =$ (h) $.2 \times .45 =$ (i) $3.6 \div 3 =$ (j) $.9 \div .3 =$ (k) $.2 \times .3 \times .4 =$ (l) $(.11)^2 =$

(m) $.4 \div 2 =$ (n) $.4 \div .02 =$ (o) $.3 + .2 \times .1 =$ (p) $.6 \div .2 - .1 =$

B) Example: estimate this quotient $2.98 \overline{) 21.0101}$ Think: this is about $3 \overline{) 21}$ so the answer is about 7

Estimate each answer:

(1) $3.98 \times 7.1234 =$ a) 10 b) 11 c) 21 d) 28 e) 32

(2) $1.9 + 2.01 + 3.701 + 4.0 =$ a) 10 b) 11 c) 12 d) 13 e) 14

(3) $4.008 \overline{) 40.998}$ a) 1 b) 9 c) 10 d) 11 e) 40

(4) $9.7 + 10.002 \times 1.8$ a) 20 b) 30 c) 50 d) 180

D5 A) Which decimal is NOT a solution for the inequality $X + .4 < 4.2$?

- (a) .2 (b) 4.6 (c) 3.6 (d) 1.00

B) Is .5 a solution for $X^2 + X + .25 = 1$?

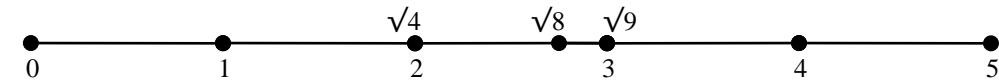
D6 A) A piece of paper is about .03 cm thick. How many centimeters tall is a stack of 1000 sheets?

- B) The budget for producing 20 sessions of Sesame Street is \$3.4 million. The producer has spent .8 of the budget on the first 15 sessions. How many dollars have been spent so far?
- C) A barometer reading dropped from 30.03 inches of mercury to 28.94 inches as the low pressure front passed through New York. How much did the barometer drop?
- D) Google stock fell \$41.50 today. It was a big drop. Google stock closed at \$385.50. At which price did Google stock open today?
- E) The formula $P = V / T$ represents the relationship between pressure of a gas with a certain volume at a certain temperature. Find P if $V = 96.90$ and $T = 10.2$
- F) The sum of two decimals is .6 and their difference is .4. What are they?
- G) The product of two decimals is .24 and their sum is 1. What are they?

D7 Square Roots

A) Find: $\sqrt{25}$ $\sqrt{100}$ $\sqrt{81}$ $\sqrt{400}$ $\sqrt{.25}$

B) Example: Find the best whole number approximation for $\sqrt{8}$
 $2 \times 2 = 4$ and $3 \times 3 = 9$, and so 3 is the closest whole number to $\sqrt{8}$
 $\sqrt{4}$ and $\sqrt{9}$ are shown on the number line and 8 is approximately placed.

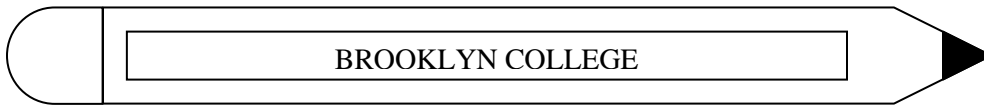


$\sqrt{17}$ is between which two whole numbers? Which is it closer to? Write it on the number line.

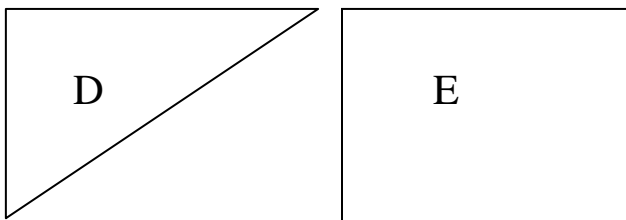
- C) Use the square root key on a calculator to find $\sqrt{17}$. What is the estimate?
- D) Which decimal is the best estimate for $\sqrt{7}$? (a) 2.4 (b) 2.6 (c) 2.7 (d) 2.8
- E) $2 \frac{1}{2}$ is the square root of which fraction? (a) $4 \frac{1}{4}$ (b) $6 \frac{1}{4}$ (c) $4 \frac{1}{2}$ (d) $2 \frac{1}{2}$ Explain.
- F) Use a calculator to test which decimal, 1.731 or 1.732, is a better estimate for $\sqrt{3}$. Explain.

MEASUREMENT

- M1 A) Estimate about how many inches long is the pencil? 2 in. 5 in. 8 in. 10 in.
 Estimate about how many centimeters long? 2 cm 5 cm 12 cm 20 cm



- B) About how many centimeters wide is this page? 10 cm 20 cm 40 cm 100cm
- C) Use a ruler to measure the length of the sides of each shape in centimeters.

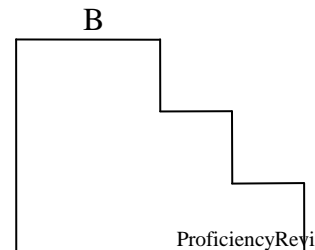
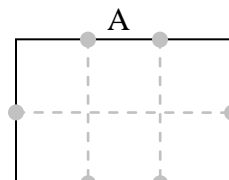


- M2 A) Find the area of figures A and B in square cm, that is, how many square cm cover each?

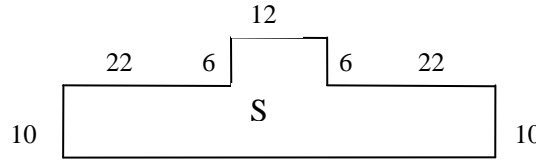
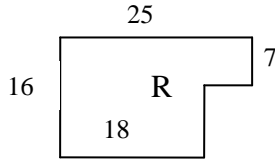
A _____ sq cm B _____ sq cm

Find the perimeter of figures A and B.

A _____ cm B _____ cm

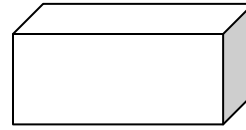


- B) What is the area in square centimeters of shape E in M1? What is its perimeter?
- C) How does the area of triangle D in M1 compare to the area of rectangle E?
What is the area of triangle D? _____ sq units Why?
- D) Suppose that this page is covered with gold leaf tiles that cost \$10 per sq cm. Use a ruler. About what would it cost to cover the page?
(a) \$50 (b) \$100 (c) \$300 (d) \$600 (e) \$6,000
- E) Find the area and perimeter of each figure. The measurements are given in millimeters (1 mm = 1/10 of a centimeter).



- F) Estimate how many square inches cover this page: a) 10 b) 40 c) 100 d) 200

- G) A shoe box is 6 inches wide, 4 inches tall, and 15 inches long.
What is the volume of the box in cubic inches? _____ cu. in.
What is the area of the shaded side of the box? _____ sq. in.
What is the area of the top of the shoe box? _____ sq. in.



- H) How many square inches in a square foot? _____ Why? In a square yard? _____ Why?
How many cubic inches in a cubic foot? _____ Why? In a cubic yard? _____ Why?

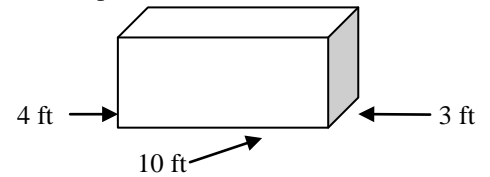
M3 A) A football field is 100 yards long and 40 yards wide. What is its area? _____ perimeter? _____

- B) Mr. Ivy League, the football coach at Dartmyth U, has his team members run around the football field 5 times before practice and twice after practice. How many yards does a player run in a week (there are five practices per week)?

- C) Mr. Gur buys a new flying carpet. It is a luxury family size carpet and is 18 feet wide and 7 yards long. It costs \$12 per square yard. Sketch this shape and label its sides in yards.
How many square yards is it? _____ How much does it cost? _____
Do you think that it is large enough for a family of 8? Explain.

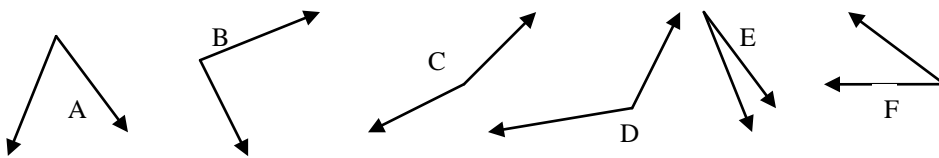
- D) Donald Trump wants a large patio on his estate, having area Y square feet. His wife sees the plans for this rectangular patio and tells the planner to double the length and double the width because she wants a larger patio for out door parties.
What is the area of her patio? (a) Y (b) 2Y (c) 3Y (d) 4Y

- E) The Richie Rip-Off Cement Company charges \$2 per cubic foot for its high quality cement. How much would it cost to fill this box with cement?

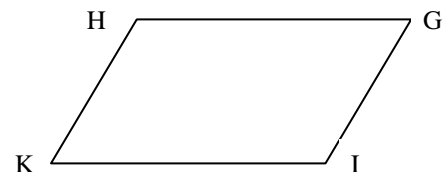


M4 A) Match each angle to one of these degree measurements:

90° _____ 60° _____ 170° _____ 10° _____ 120° _____ 40° _____



- B) What is the size of angle G? 40° 70° 140° 170°
What is the size of angle H? 20° 70° 140° 170°
What is the sum of the degrees of the four angles of KIGH?



- C) Which angles in part A) are acute?
Which angles are obtuse?

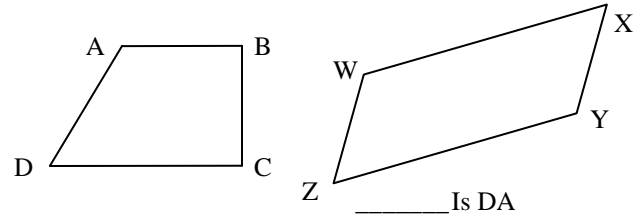
- D) Pairs of angles that add to 90° are called complementary angles. Are any pairs of angles in part C) are complementary?
Are any pairs of angles supplementary?

- E) Draw a right triangle. Are its other angles acute or obtuse? Try this again for another right triangle. Do you get similar results?

What is the total number of degrees in the angles of these triangles?
 What is the sum of the degrees in the angles of any rectangle? Why?

GEOMETRY

- G1 A) Are sides AB and DC parallel? _____ sides AD and BC? _____
 Are sides WZ and XY parallel? _____ sides WZ and ZY? _____
- B) Are sides AB and BC congruent? _____ WZ and XY? _____
 Are angles B and C congruent? _____ angles D and A? _____
 Are angles Z and X congruent? _____
- C) Is DC perpendicular to BC? _____ Is AB perpendicular to BC?
 perpendicular to CD? _____



- D) Draw two points, A and B, and a line through them. Then draw a line through A and perpendicular to line AB.
 Also do this through point B. What can you say about the two lines you drew?

- G2 A) Ralph contends that A and F are squares. Is he correct? Explain.

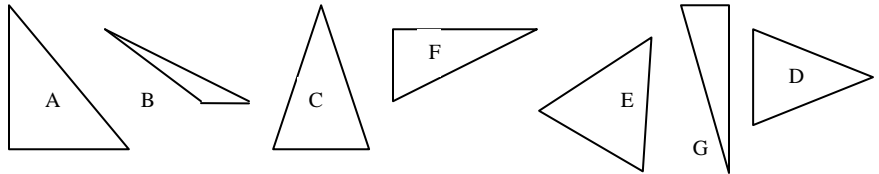
- B) Which of these shapes are polygons? Which are not quadrilaterals.

- C) Which can be called “parallelograms”? Explain.

- D) Are any pentagons? Hexagons? Octagons?

- E) Kareem claims that the top of the shoe box in problem in M2 G) is a rectangle. Do you agree? _____
 He also claims that the box is a cube. Is it? _____ Explain.

- F) Which of these are isosceles triangles?
 Are any equilateral triangles?
 Which are right triangles?



- G) Roberta claims that you can put two congruent right triangles together to form a square. Is she correct?
 Her brother, Roberto, thinks that it is possible to put them together to get a quadrilateral that is not a square. Is he correct too?

- G3 A) Make drawings to test which of these properties are true for squares.

- (a) Its opposite sides are parallel. True False
 (b) All of its angles are equal. True False
 (c) A diagonal divides it into two equilateral triangles. True False
 (d) Its two diagonals meet, forming four congruent triangles. True False
 (e) Its two diagonals meet, forming four acute angles. True False

- B) Which of the properties above is true for any rectangle?

- C) Draw two shapes that have the following two properties:
 It is a quadrilateral. Its opposite sides are parallel.
 Could the shape be a rectangle? _____ square? _____ parallelogram? _____

- D) Which statements are true:

- I. In an isosceles triangle, there are two congruent sides and two congruent angles.
 II. In an isosceles triangle, there are two congruent angles.
 (a) Only I (b) Only II (c) Both I and II (d) Neither I nor II

- G4 A) Which shape is a polyhedron?

- (a) cone (b) sphere (c) cube (d) cylinder

- B) Which is not a property of a cube?

- (a) it has 6 faces (b) it has 6 corners (c) it has 12 edges (d) it has 8 vertices

- C) Are the ceiling and the floor parallel or intersecting planes?

- D) The ceiling intersects with a wall in a (a) point (b) line (c) plane (d) solid

- E) Susie has a good visual imagination and thinks about three dimensional shapes such as cubes and pyramids just as she thought about properties for plane figures as in B and C above. Which is true for cubes?
 (a) Opposite faces of a cube are parallel. (b) All six faces of a cube are congruent.
 (c) Some edges of the cube are perpendicular.

RATIO AND PERCENT AND PROPORTIONS

P1 Examples: Per cent means “per hundred” 4% means “4 out of 100”
 200% means 200/100 or 2 (i.e., double)

- A) Write as a percent: $5/100$.25 $300/100$
 B) Write each percent as a fraction and a decimal: 50% 1% 100% 120%

- C) Example: Change 4 1/2 % to a decimal.
 4 1/2 % is half way between 4% and 5%, or
 half way between .04 and .05, or
 half way between .040 and .050, so its .045

Change each percent to a decimal: $8\frac{1}{2}\%$ $23\frac{1}{4}\%$

- D) Write these decimals as a percent: .0725 .015 .6375

- E) Example: Change 18/20 to a percent.
 $18/20 = X/100$ so $X = 90$

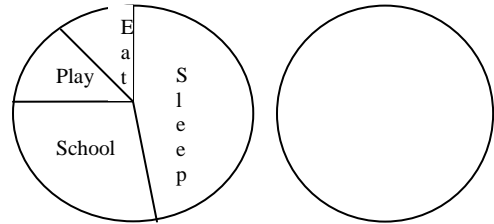
$$\begin{array}{r} .90 \\ 20 \overline{) 18.00} \\ \underline{-180} \\ 00 \end{array}$$

or 90%

Change these fractions to a percent:
 $22/25$ $45/50$ $31/365$ (approximately)

- F) About what % does Jenny sleep? _____ eat? _____ school? _____

- G) Draw a circle graph and shade in about 74%.



- P2 A) Find 12% of \$2,000. What is 300% of 400?
 B) What is 7 1/2 % of \$2000 and 3.25 % of 8000.
 C) Judy gets 21 of 25 questions correct on her spelling test.
 Her sixth grade teacher has students compute the percent correct and keep a record of it. What is her percent?
 D) Bob earns 8 1/2 % interest on a 1-year CD at the New York Dime bank. How much interest does he earn on a \$2500 CD?
 E) The interest rate on a VISA card is 17.5% per year. You forget to pay a \$500 bill for one year and suddenly get a call from VISA.
 How much interest do you owe?
 F) Ms. P. Cent bought a new fur coat on a 40% off sale at Bummingdales. The original price of the coat was \$2000. What was the discounted price of the coat?
 How much did she pay, including an 8% sales tax?
 G) In a raffle, 5% of the 5000 contestants will be selected as finalists. Of these, only 10% will get a prize.
 How many contestants will get a prize?
 H) The B. S. Hutton Investment Company charges 2 1/2% commission when you buy or sell a stock.
 What commission do you pay to buy 100 shares of Ben and Jerry’s ice cream at \$20 per share?
 I) According to the New York Times (Aug 10, 2006) “a frightening number of babies are being exposed to drugs in the womb.”
 Results of a recent nation-wide survey revealed that almost 11% of the 3 million babies born each year might incur damage from their mother’s drug abuse. About how many babies is this?
 (a) 11,000 (b) 30,000 (c) 110,000 (d) 330,000 (e) 3,000,00

- P3 A) Write a ratio for the number of A’s to B’s AAAAAABBBAAA
 If there were 600 letters (A’s or B’s) in the same ratio as here, how many A’s would there be and how many B’s?

- B) The ratio of boys to girls in Mrs. Jom's class is 5:4. If there are 15 boys, how many girls are there?
- C) If the ratio of chickens to ducks on Farmer Brown's farm is 4:1 and there are 10 ducks, how many animals are on his farm?
- D) Bill has 40¢ in dimes and 40¢ in nickels. What is the ratio of the number of dimes to nickels?
- E) What is the ratio of the length of line segment AB to line segment AC? AC to AB? What is the ratio of AB to BC?

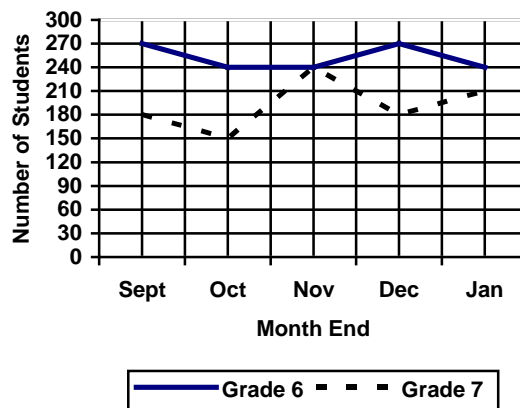


- P4 A) The sides of a rectangle are 8 cm and 4 cm. A much larger rectangle is similar to this rectangle. Its shorter side is 12 cm. What is the ratio of the corresponding sides of these two similar rectangles? What is the length of its larger side? Why?

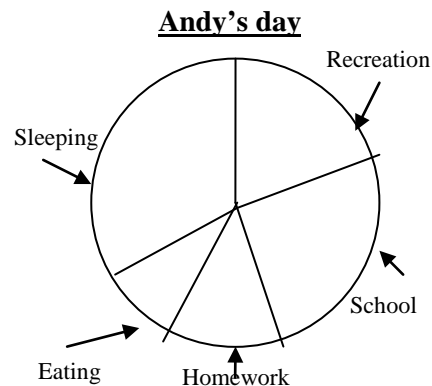
DATA INTERPRETATION AND PROBABILITY

- S1 A) In which month did both grades have the same average attendance?
- B) During which month did the average attendance in grade 7 decrease the most?
- C) What is the ratio of the attendance of 6th graders to 7th graders in September?
- D) If September had 21 school days, about how many 6th graders attended school during the whole month?

Average Monthly Attendance For Grades 6 and 7

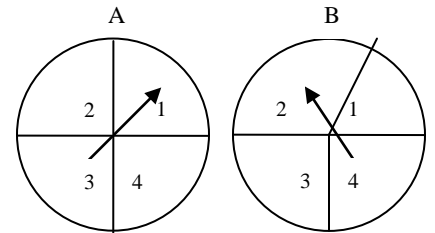


- E) According to the pie graph, about how much time does Andy spend on recreation?
a) 2 hours b) 4 hours c) 5 hours d) 8 hours e) 10 hours
- F) Which two activities combined take more time than sleeping?
a) homework and eating b) school and recreation d) eating and recreation
- G) Which question CANNOT be answered using the information in the circle graph?
a) What percent of the time does Andy sleep?
b) How many hours does Andy sleep?
c) Which are Andy's favorite activities?
d) How many more hours does Andy spend on homework than eating?



- S2 A) Find the average of Bill's test scores: 90, 80, 80, 80, 90, 90
- B) The average of Judy's three tests was 90%. She got an 80% on the first test and 90% on the second. What percent did she get on the third test?
- C) Find the average of 1, 2, and 3. _____
Find the average of 1, 2, 3, 4, 5, 6, 7. _____
Can you guess the average of 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13?
- D) Mary is the captain of Brooklyn College Keglers, a hot bowling team in the NYC Muni-Bowl League. What is Mary's average today if she rolled 200, 210, and 136 (sorry, she hurt her thumb)?
- E) You want to get a B in Prof. W. Snakespear's English Lit course. You need an 80% average on tests to do this. So far you have 86%, 74%, and 88%.
What must you get on the last test to earn the B?
a) 62% or above b) at least 72% c) 80% or better d) 82% or higher

- S3 A) Find the range, median, mean, and mode for: 2, 3, 4, 5, 2, 3, 2, 5, 1
- B) If the mode of Jim's tests was 80% and the mean was 80% too, which sets of data could not have been his?
 a) 80, 70, 90 b) 80, 80, 80, 70, 90 c) 80, 80, 70
- S4 A) Lucy rearranges 3 cutout letters C, A, T to make different 3-letter "words" like "ATC". Using each letter once in a "word" how many different 3-letter "words" can she make?
 a) 3 b) 6 c) 9 d) 12
- B) Brenda sells ice cream cones. They come in the flavors: vanilla, chocolate, cherry, and strawberry. Cones come in 2 sizes: small and large. Ruth buys a cone. What is the probability that it is a small cherry cone?
 a) 1/4 b) 1/6 c) 1/8 d) 4/8
- S5 A) A bag of jelly beans has 10 pieces: 4 cherry and 6 lemon. The chances of picking a cherry one at random are 4 out of 10, or 4/10. What are the chances of picking at random a lemon? _____ out of _____ or ____/____
- B) A small bag of M & M's has 10 red, 20 brown, 8 yellow, and 2 green. What are the chances of picking at random a green? _____ out of _____, ____/____ a brown? _____ out of _____, ____/____ a red or a brown _____ out of _____, ____/____
- C) What is the probability of spinning a "1" on spinner A? a "4" on spinner B?
 a "1" on spinner B? _____
 Are outcomes on spinner A equally likely? On spinner B?
- D) Niko and Gracie play a game. The winner is the player that spins an even number. Niko uses spinner A, Gracie spinner B. Is the game fair? Explain.
- E) You roll a fair die. What is the probability of rolling a "2"? _____ more than 2? _____ an even number? _____
- F) If you roll a fair die 200 times, about how many 2's should you roll?
 a) 20 b) 30 c) 50 d) 80



ALGEBRA

- A1 A) What is an expression for the number of cents in P pennies and Q quarters?
 (a) $P + Q$ (b) $P + 5Q$ (c) $5P + Q$ (d) $P + 25Q$ (e) $25(P + Q)$
- B) At Methodist Hospital X mothers give birth to twins and Y mothers give birth to triplets, while N mothers have single child births. What is an expression for the total number of babies born.
 a) $X + Y + N$ b) $2X + 3Y + N$ c) $(X + 2) + (Y + 3)$ d) $X * Y * N$ e) $2 + 3 + N$
- C) Jane has P pennies and N nickels. What expression tells how many coins she has?
 a) $P + N$ b) $P + 5N$ c) $5P + N$ d) $1 \cdot P + 5 \cdot N$
- A2 A) Compute: $^+3 + ^-5 =$ $^-3 + ^+5 =$ $^-3 + ^+4 * ^-2$
- B) If $A = ^+2$, $B = ^-3$, $C = ^+3$, find the value of X and Y where $X = (A + B) * (B + C)$, $Y = -2 * B + A$
- C) Is -2 a solution for $X * X + X + 1 = 0$?
- D) Is -2 a solution for $(X + 2)(X + 3) = 0$?
- A3 A) $X = 4A * B$ and $Y = W/E$?
 a) Find X if $A = 4$ and $B = 8$. Find Y if $E = 8$ and $W = 24$.
 b) Find A if $X = 48$ and $B = 1$. Find E if $Y = 10$ and $W = 20$
- B) $P = 2(L + W)$. If $L = 12.4$ and $W = 8.6$, find P.
 Find P if $L = 1/2$ and $W = 1 1/4$.
- A4 A) For how many equations in the box is 2 a solution?
 None one Two Three
- | | | | | |
|-------------|-------------|-----------|--------------|----------------|
| $X - 1 = 3$ | $3 - X = 1$ | $X^2 = 9$ | $3X - 2 = 4$ | $3(X - 2) = 4$ |
|-------------|-------------|-----------|--------------|----------------|
- B) Find the solution for equations. Think out an answer.
 $X - 1 = 23$ $2X = 64$ $X + X = 50$ $34 - X = 2$ $13 = 2X + 1$ $X^2 = 9$

A5 A) Find the 10th number in this pattern. What is the rule for the Nth term? 4, 8, 12, 16, 20, ...

B) Fill in the boxes in this IN-OUT function table. Also, find the rule for the OUT numbers.

IN	2	3	10	8	20		101
OUT	5	7	21	17		101	

A6 A) Ed can have a burger with or without cheese. A cheese burger has C calories, a slice of cheese has 100 calories, and a burger without cheese has B calories. Which equation could you use to find the calories of a burger without cheese?

a) $B - C = 100$ b) $B = C - 100$ c) $C = B - 100$ d) $B = 100 + C$

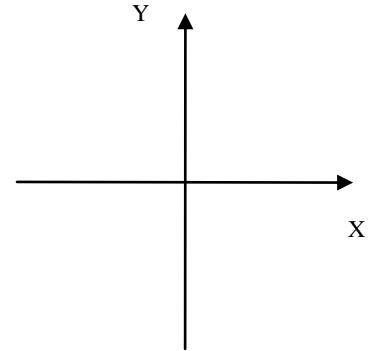
B) Write an equation for T, the total cost of R regular 39 cent stamps and P postcard stamps that cost 24 cents each. Use the equation to find how many postcard stamps George W got if he spent \$4.86 and got 10 regular stamps.

C) Think! Use these clues to figure out the values of A, B and C. Explain.

Clue 1: $A + A = 10$ Clue 2: $A - B = 2$ Clue 3: $A + B + C = 10$

A7 A) Complete this table for equation $X - Y = 2$. Then graph it on the coordinate grid.

X	Y
5	
	0
0	
1	


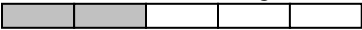


ANSWERS

WHOLE NUMBERS

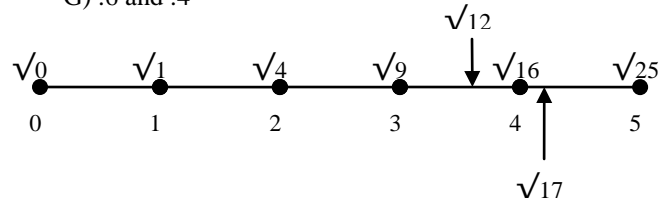
- W1 A) a) 403 b) 3690 c) 18 d) 204 e) $6 \times 4 = 24$ $6 + 4 = 10$ $6 - 4 = 2$, difference
 B) (Recall: do what is in parentheses first, then exponents, and then do multiplication and division before addition and subtraction.)
 A=17 B=27 C=11 D=27 E=23 F= $15 - 12 + 8 = 11$
 C) A, B, C are correct; D could be Think: What times 3 is 150, that's 50
- W2 A) 32 mpg B) \$242 C) 150,000 D) 41 E) 3 elephants F) 8 & 4
 G) 3 oranges, 1 banana, 2 apples 3 bananas, 2 oranges, 1 apple
- W3 A) a) 8 million b) 4 hundred c) 0 hundred million d) 9 billion e) 286
 B) 4 million, digit in millions place is 7
- W4 Example: 15 is a multiple of 5 because 15 is 3×5 (i.e. three 5's)
 The multiples of 5 are: 5, 10, 15, 20, 25, 30, 35, ...
 The multiples of 2 are: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, ...
 The common multiples of 5 and 2 are: 10, 20, 30, ...
 The least common multiple of 5 and 2 is 10
 A) 24, 42, 600 B) 3: 3, 6, 9, 12, 15, 18, 21, 24 4: 4, 8, 12, 16, 20, 24, 28
 C) 12, 24, 36 D) LCM = 12 E) LCM = 36 F) X is 5
- W5 A) 1, 12, 2, 6, 3, 4
 B) Smallest = 1 Greatest = 6
- W6 A) 3,204 Three thousand two hundred four
 B) $1 \times 10^7 + 2 \times 10^6 + 3 \times 10^5 + 4 \times 10^4 + 5 \times 10^3 + 6 \times 10^2 + 7 \times 10^1 + 8 \times 10^0$
- W7 A) Primes have only two divisors: 1 and itself. $6 : 3 \times 2, 6 \times 1$ $15 : 3 \times 5, 1 \times 15$ $51 : 3 \times 17, 1 \times 51$
 B) i) Never $5 + 7 = 12$ ii) Always iii) Sometimes true $5 + 2 = 7$ but $5 + 11 = 16$ iv) never $2 \times 3 = 6$
- W8 A) 1,500 48,400; 2,000 48,000 B) a about 400 x 10, or 4000 C) b D) c about how many 200's in 800? 4
 E) about 21 in a row and 28 rows, about 600. F) $60 \times 60 \times 24 = 86,400$ seconds in a day d

FRACTIONS

- F1 A) rectangle, $1/2, 2/4, 8/16$ rectangle, $8/16$ or $1/2$ circle, about $1/8$ B)  $4/6 > 1/2$
 C) $2/3$ D) 
- F2 A) $8/10$ $40/50$ $52/65$ B) $9/14$ C) d D) $36/48 = 3/4$, so is equivalent to $6/8 = 3/4$ E) $1/3, 2/6, 3/9$
 F) Yes
- F3 A) $7/9$ B) 0,1,2,3,4 C) $5/8 = 25/40$ $3/5 = 24/40$ D) b
- F4 A) $4 \frac{1}{10}$ $11 \frac{3}{7}$ B) $19/5$ $83/10$
- F5 A) (1) Think: $5 + 3 = 8$ c (2) Think: $100 - 5$ is 95 b (3) $3 \times 220 = 660$ b (4) $24 \div 2 = 12$ b
 B) (a) $6/8$ (b) $1/6$ (c) $8/15$ (d) $2/3 \div 1/6 = 2/3 \times 6/1 = 12/3 = 4$ (e) $5/2 \times 7/2 = 35/4 = 8 \frac{3}{4}$ (f) $8/3 \div 4/3 = 8/3 \times 3/4 = 2$
 (g)
$$\begin{array}{r} 3 \frac{2}{3} \\ + 6 \frac{4}{6} \\ \hline 9 \frac{8}{6} = 10 \frac{2}{6} \end{array}$$
 (h) $11 \frac{5}{6}$ (i) $4/9 + 5/9 = 1$ (j) $19/9$ k) 53
- F6 A) Yes B) $W = 6/4 = 1 \frac{1}{2}$ C) $2/3 = 8/12$, no D) $4/9 + 2/3 - 1 = 4/9 + 6/9 - 1 = 1/9 \neq 0$ E) c F) c
- F7 A) $5 \times (3 \frac{6}{10} + 3 \frac{6}{10}) = 36$ miles B) $2 \frac{1}{10}$ C) 32, 212 D) 5 ounces E) $4 \frac{1}{3}$ in F) b G) \$90

DECIMALS

- D1 A) .5 (which can be written as 0.5), $\frac{1}{2}$ B) b .62 little more than $\frac{1}{2} = .5$, about .6 C) F, D, O, A, Q
 D) D (.42 is about .4), A (.09 is about .1), S, P (1.599 is about 1.6), D (.40099 is about .4)
- D2 A) .4 Four tenths .32 Thirty-two thousandths 5.32 Five and thirty two hundredths .0013 Thirteen ten thousandths
 B) $\frac{75}{100}$ or $\frac{3}{4}$ $\frac{5}{1000}$ $\frac{875}{1000}$ or $\frac{7}{8}$ C) $\frac{20}{100} = \frac{1}{5}$ $\frac{375}{1000} = \frac{3}{8}$ $2.5 = 2 \frac{5}{10} = 2 \frac{1}{2}$
 D) .8 .75 .84 .084
- E) $.6666\dots$ or $\frac{2}{3}$ $\frac{7}{9} = .777\dots$ or $\frac{7}{9}$ $\frac{12}{99} = .1212\dots$ or $\frac{4}{33}$ $\frac{1}{7} = .142857\dots$ $\frac{36}{99} = .3636\dots$ or $\frac{4}{11}$
- F) Pattern .XYXYXY171717...
- D3 A) 5 hundredths 6 thousandths 2 tens 9 millionths B) .2 3.8 23.1
 C) .91 3.79 23.10 D) .05 .08 .19 .04 E) .012 .09 .34 .6 1.0 1.01 1.2
- D4 A) (a) .9 (b) .85 (c) .875 (d) 1.04 (e) 3.64 (f) .06 (g) 2.0 (h) .090
 (i) 1.2 (j) 3 (k) .024 (l) .0121 (m) .2 (n) 20 (o) .32 (p) 2.9
- B) (1) Think $4 \times 7 = 28$ d (2) Think $2 + 2 + 4 + 4 = 12$, 12 c
 (3) Think $4 \sqrt{41}$ is about 10 c (4) $10 + 10 \times 2$ is 30 b
- D5 A) b B) $.25 + .5 + .25 = 1$, yes
- D6 A) $1000 \times .03 = 30$ cm B) $.8 \times 3.4$ million = \$2.72 million C) 1.09 in.
 D) $\square - 41.50 = 385.50$, so \square is \$427 E) 9.5 F) .5 and .1 G) .6 and .4
- D7 A) $\sqrt{25}$ is 5 because $5 \times 5 = 25$ 5, 10, 9, 20, .5
 B) $\sqrt{17}$ is between 4 and 5, closer to 4
 C) 0 in 4.1231056
 D) b $2.6 \times 2.6 = 6.76$, 24 away from 7, and $2.7 \times 2.7 = 7.26$, .26 away from 7, so 2.6 is closer
 E) b F) 1.732 is closer



MEASUREMENT

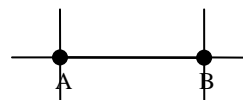
- M1 A) 5 in 12 cm B) about 20 cm C) 3 cm, 4 cm, 5 cm E) about 3 cm by 4 cm
- M2 A) 6 sq units, 9 sq cm B) area of E : $3 \times 4 = 12$ sq cm; perimeter = $3 + 4 + 3 + 4 = 14$ cm
 C) triangle D is $\frac{1}{2}$ area of rectangle E area = $12 \div 2 = 6$ sq cm
 D) about $28 \times 22 = 616$ cost $\$616 \times 10 = \6160 , about \$6000
 E) Perimeter = $18 + 16 + 25 + 7 + 7 + 9 = 82$ Perimeter = $10 + 22 + 6 + 12 + 6 + 22 + 10 + 56 = 144$ mm
 Shapes can be broken into parts in different ways to find the area. One way is:
 Area = $(18 \times 16) + (7 \times 7)$ or $(25 \times 7) + (18 \times 9) = 337$ sq cm Area = $(10 \times 22) + (12 \times 16) + (10 \times 22) = 632$ sq mm
- F) $8 \frac{1}{2} \times 11$ is about 9×11 or 99 c) 100
 G) Volume = $4 \times 6 \times 15 = 360$ cubic in Area of shaded side of box = $6 \times 4 = 24$ sq in Area of top = $6 \times 15 = 90$ sq in
 H) $12 \times 12 = 144$ sq in $36 \times 36 = 1296$ sq in $12 \times 12 \times 12 = 1728$ cubic in $36 \times 36 \times 36 = 46,656$ cubic in
- M3 A) Area is 40×100 or 4,000 sq. yds.; perimeter is 280 yards
 B) $7 \times 5 = 35$ times around 280 yards; $35 \times 280 = 9,800$ yards
 C) 7 yards by 6 yards = 42 sq. yds. Cost: \$504; yes
- D) d explanation by example: $10 \times 30 = 30$ and $20 \times 60 = 1200$
 explanation by algebra: $L \times W = \text{Area}$ so $(2L) \times (2W) = 4(LW)$
- E) $10 \times 3 \times 4$ is 120 cu. Ft. $\times \$2$ is \$240
-
- M4 A) A = 60° B = 90° C = 170° D = 120° E = 10° F = 40°
 B) G is 40° and H is 140°, sum is 360° C) A, E and F are acute (less than 90°); C and D are obtuse (more than 90°)
 D) no complementary angles. In KIGH, K and I are supplementary, G and H, G and I, and K and H
 E) Both angles will be acute; sum of angles of triangle = 180°; sum of angles for rectangles is $4 \times 90 = 360^\circ$

GEOMETRY

- G1 A) yes; no; WZ and XY, yes; WZ and ZY, no
 B) yes, AB and BC are the same length; yes, WZ and XY; no, angles B and C do not have the same measure; no, angles D and A; yes, angles Z and X
 C) yes, yes; no D) lines are parallel

- G2 A) no, not A because all sides are not equal length B) all except E and I. Polygons must have straight sides; not quads: B, E, I, G
 C) A, D, F, J are parallelograms (i.e. 4-sided; opposite sides parallel) D) no (5-sided); no hexagons (6-sides); one octagon, B
 E) yes; not a cube which must have a square for each face
 F) Isosceles have 2 congruent sides, C, D, E; equilateral have 3 equal sides, D; right triangles : A, F, G
 G) Roberta is not correct (e.g. Triangle F), but it works for two congruent isosceles right triangles. Roberto is correct.

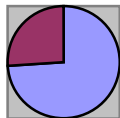
- G3 A) a) True b) True (all equal 90°) c) False (get isosceles triangles) d) True e) False (get right angles)
 B) a, b C) must be a parallelogram and could be a square or rectangle D) c



- G4 A) c B) b C) Parallel planes D) Intersect in a line E) a, b, c

RATIO AND PERCENT AND PROPORTIONS

- P1 A) 5% 25% 300% (or triple)
 B) $50/100 = 5/10 = 1/2$, or .5 $1/100$ or .01 $100/100 = 1.00$ $120/100 = 1$ $20/100 = 1/5$ or 1.20
 C) .08 and 1/2% more .085 .2325; .0823 and .0791 D) 7 1/4% 1 1/2% 63 3/4%
 E) 88%; 90%; and about 365 $\sqrt{31.000}$ 8% F) sleep: about 45%; eat: about 1/2 of 25% or 12 1/2%; school: about 30%



- G) 74% is a little less than 3/4 or 75%

- P2 Example: How much is 14% of \$200?

Proportion Method

14% of \$200

$$\frac{14}{100} = \frac{X}{200}$$

$$100X = \$2800$$

$$X = \$28$$

0 14% 100%

0 \$X \$200

Decimal Method

.14 of \$200 = X, or .14 x \$200 = X

$$\begin{array}{r} 200 \\ \times .14 \\ \hline 800 \\ 2000 \\ \hline 28.00 \end{array}$$

- A) Proportion Method: $12/100 = X/2000$ so $X = \$240$ Decimal Method: $.12 \times \$2000 = \240.00 3.00×400 (or triple 400) is 1200

- B) Example: $2\frac{1}{4}\%$ of \$50 is how much?
 $2\frac{1}{4}\%$ of \$50 is $.0225 \times \$50$, or

$$\begin{array}{r} 50 \\ \times .0225 \\ \hline 250 \\ - 100 \\ \hline 100 \\ \hline \$1.1250 \end{array}$$

or \$1.12 1/2, or \$1.13 rounded

- .075 x 2000 = \$150 .0325 x 8000 = \$260
 C) 21/25 is 84% D) \$212.50 E) \$87.50

- F) 40% off of \$2000 is \$800 off cost is $2000 - \$800 = \1200 tax: $.08 \times \$1200 = \96.00 Total: \$1296

- G) 5% of 5000 is 250 10% of 250 is 25

- H) $.025 \times 100 \times 20$ is \$50 I) d (almost 1/3 of a million babies) ($.11 \times 3,000,000 = 330,000$)

- P3 A) Ratio of A's to B's is 9 : 3 or 3 : 1. 1 out of every 4 letters is a B so out of 600 $1/4$ of 600 = 150 B's so, $600 - 150 = 450$ A's.
 Check: $450 : 150 = 3 : 1$ Yes

- B) $5 : 4 = 15 : X$ so $5/4 = 15/X$ and $5X = 60$ so $X = 12$. Check: $5/4 = 15/12$

- C) 4 : 1 ratio and 10 ducks so, $4 : 1 = C : 10$ and C is 40, and total of $40 + 10 = 50$ animals

- D) 40¢ in dimes = 4 dimes 40¢ in nickels = 8 nickels. Ratio is 4 : 8

- E) $AB : AC = 2 : 3$ $AC : AB = 3 : 2$ $AB : BC = 2 : 1$

P4 A) 4:12; larger side = 24 cm

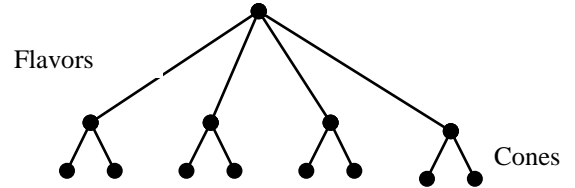
DATA INTERPRETATION AND PROBABILITY

S1 A) Nov B) Dec C) 270 : 180 or 3 : 2 D) $21 \times 270 = 5,670$ 6th graders E) a little less than 1/4 of 24 hours, so 5 hours c
F) b G) c

S2 A) average is 85% B) 100% C) average is 2; average is 4; for this pattern of numbers the average is middle term, 7
D) 182 E) b

S3 A) range = $5 - 1 = 4$; the mode is 2, the most frequent number in data set; median is 3, the middle number of the ordered data: 1, 2, 2, 2, 3, 3, 4, 5, 5; the mean is $27 / 9 = 3$
B) c because while mode is 80, the mean is below 80; a there is no mode

S4 A) 6 combinations CAT CTA TAC TCA ACT ATC
 $3 \times 2 \times 1 = 6$ combinations.
B) There are $4 \times 2 = 8$ possible kinds of cones, so the probability is 1/8 c



S5 A) 6 out of 10, or 6 / 10 B) Green 2 out of 40, or 2 / 40; brown: 20 / 40, or 1/2; brown or red: 30 out of 40, 3/4
C) 1 on A is 1/4 4 on B is 1/4 1 on B is about 3/8 equally likely on A, yes; on B, no.
D) NOT Fair game since probability of even on spinner A is 2/4 but more on spinner B.
E) 2 : 1/6; more than 2 (3, 4, 5, 6) : 4/6; even number : 3/6
F) 2's come up 1 out of 6, so 1/6 of 200 is about $1/6 \times 200 = 33$, so about 30 b.

ALGEBRA

A1 A) d B) b C) a Careful: the question asks how many coins, not the value of the coins which is $P + 5 N$

A2 A) $^{-}2$ $^{-}8$ $^{-}3 + ^{-}8 = ^{-}11$
B) $X = (2 + ^{-}3) * (^{-}3 + 3) = (^{-}1) * 0 = 0$ $Y = ^{-}2 * ^{-}3 + ^{-}2 = ^{-}6 + ^{-}2 = ^{-}8$
C) No $(^{-}2) (^{-}2) + (^{-}2) + 1 = ^{-}3$ D) Yes $(^{-}2 + 2) * (^{-}2 + 3) = 0 * 1 = 0$

A3 A) a) $X = 4(4)(8) = 128$ $Y = 24/8 = 3$ b) $A = 12$ $E = 2$
B) $P = 2(12.4 + 8.6) = 2(21.0) = 42.$ $P = 2(1/2 + 1 \ 1/4) = 2(1 \ 3/4) = 3 \ 1/2$

A4 A) two: $3 - 2 = 1$ and $3(2) - 2 = 4$
B) $X = 24$ $X = 32$ $X = 25$ $X = 32$ $X = 6$ $X = 3$ (or -3) since $3^2 = 3 \times 3 = 9$ $-3 \times -3 = 9$

A5 A) Pattern goes up by 4's, so 10th term is $10 \times 4 = 40$ Nth term is $4N$

B) If IN = 100, OUT = 201, and rule is $2N + 1$, double the IN number and add 1
Or $N + (N + 1)$, the IN number plus that number and 1 more.

IN	20	50	101
OUT	41	101	203

A6 A) b B) $T = 39R + 24P$ $4.80 = 10 \times .39 + 24P$, so $P = 4$, or spend $10 \times 39, 3.90$ and have \$.96 left, so 4 24¢ stamps.
C) $A = 5$, so $B = 3$, and $C = 2$

A7 Table for four sample points.

X	Y
5	3
2	0
0	-2
1	-1

Graph results in a straight line.

