



## Math Trivia

Leonard Euler (1707 - 1783) was one of the most productive writers of scientific and mathematical books and papers. Even though he was blind, he introduced a new brand of geometry called topology. He also established various notations which we still use today, such as  $p$  and the labeling of triangles.



## Investigations

Draw a large keypad of a touch-tone telephone. Notice that there are three letters for most of the numbers. Given the following telephone numbers, what words or phrases could they spell. How many different possibilities can you find?

8 3 2 2 4 3 7  
or  
7 2 4 6 6 5 5



What strategies could you develop to help you discover possible words?  
Write a secret message to a friend using the phone keypad.

(1.03)

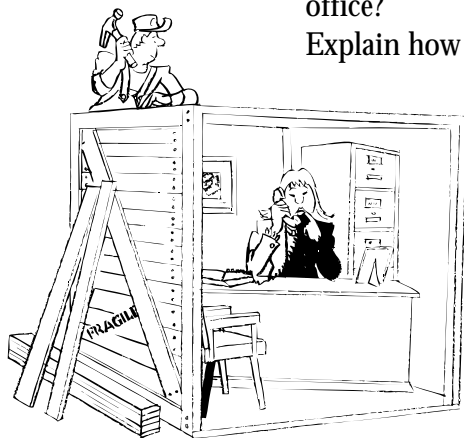


## Using Numbers in Powerful Ways

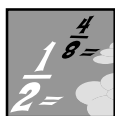
The perimeter of a rectangular office is 36 feet. What is the largest possible area for the office?

What are logical whole number dimensions of the office?

Explain how you got your answer.



(1.03)



## Decimal Fraction Fun

What portion of a fence still needs to be painted if 0.25 is red, 0.45 is blue and half of what is left is painted yellow?



(1.02)



## For Further Study

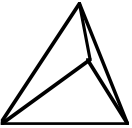
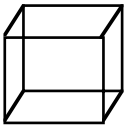
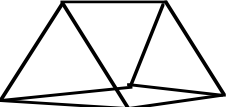
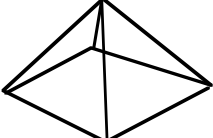
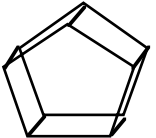
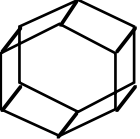
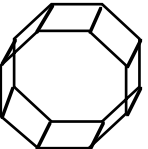
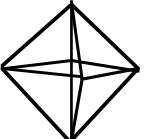
Investigate the famous Konigsberg bridge problem and discover Euler's Equation on the next page.

(1.03)



Names: \_\_\_\_\_

and \_\_\_\_\_

Shape	Name	# of Faces	# of Vertices	# of Edges
	Tetrahedron			
	Cube			
	Triangular Prism			
	Square Pyramid			
	Pentagonal Prism			
	Hexagonal Prism			
	Octagonal Prism			
	Octahedron			

**Part II:** Look for a pattern relating faces, vertices, and edges. Talk with your partner to see if you could write the formula for finding the number of edges of a given solid figure. This formula is called Euler's (pronounced "oilers") Equation.

(3.04, 5.01)



## Keeping Skills Sharp

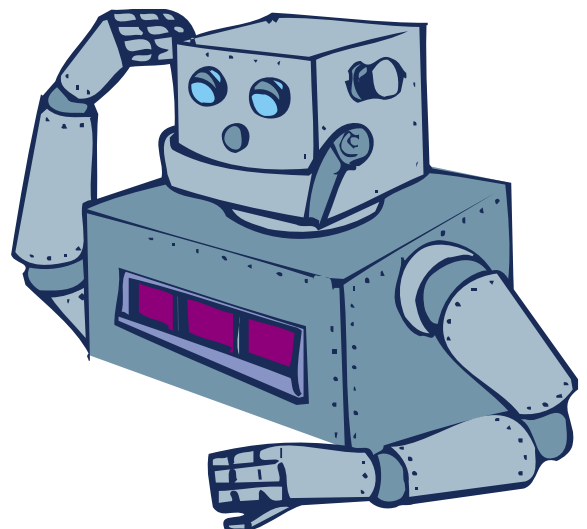
1. Terry has 290 dimes, How much money is this?
2.  $407 \times 70$
3.  $n \div 8 = 600$      $n = \underline{\quad}$
4. Which is the most reasonable answer for the length of a tablecloth?  
108 inches                      108 feet                      108 yards
5. Bananas cost 59¢ a pound; apples cost 99¢ a pound; peaches cost 89¢ a pound. What is the cost for two pounds of bananas, three pounds of apples and a pound of peaches?
6. Which is correct?     $6841 < 6589$      $6895 < 6985$      $6481 > 6549$
7. Mexico was founded in 1325. How many years ago was this?
8. Wendy boarded the train at 11:15 a.m. She arrived a 4:30 p.m. How long was the trip?



## Solve this!

There are two sizes of tables available at school. One seats exactly 4 people. The other seats 6 people. There will be 82 students at a special luncheon. The principal would like for everyone to be seated at once with no extra, empty seats. How can she do this? Is there more than one way?

How many tables of each size should be ordered?



(1.03, 3.04)



# To the Teacher ..

Grade 5

WEEK  
28

Geometry is the focus for this Week by Week Essentials. Students are given the opportunity to study Euler and investigate his Equation.

**Using Numbers in Powerful Ways:** A square will give the largest possible area and a square is a rectangle, so a 9' x 9' office would give an area of 81 feet<sup>2</sup>. Also accept the rectangular dimension 10 feet x 8 feet = 80 ft<sup>2</sup>.

## Solve This:

Table of 4	Tables of 6
1	13
4	11
7	9
10	7
13	5
16	3
19	1

## Fraction Fun:

0.15 still needs to be painted.

## Mental Math

Directions to Students: Number your paper from 1 to 10. Write your answers as the questions are called out. Each question will be repeated only once.

1.  $11 \times 4 - 2 \div 6$
2.  $8 \times 7 + 4 \div 10 \times 8$
3. Write in mixed number and decimal form  $5/3$
4. Nearest whole number to  $38/6$
5. Prime numbers between 40 and 50
6. Closed figure with 3 sets of parallel lines
7. Meters in 125 centimeters
8. Feet in 10 yards
9. How many dozen in 30?
10. Area of rectangle 3 ft. long and 9 ft. wide

## Keeping Skills Sharp

1. \$29.00
2. 28,490
3. 4,800
4. 108 inches
5. \$5.04
6.  $6895 < 6985$
7. From 2000: 675
8. 5 hrs. 15 min.



## Math Trivia

A year is the time it takes for the earth to revolve around the sun once. A calendar year is 365 days. A solar or tropical year is 365 days, 5 hours, 48 minutes, and 46 seconds. Leap year occurs every 4 years, when all the extra hours, minutes, and seconds of the solar year are added up to make an extra day.



## Investigations

How many squares can be formed on a geoboard with sides parallel to the sides of the geoboard? Experiment to find out. Record on geopaper. How many total squares can be formed on a geoboard? (Some squares can be made which do not have sides parallel to the sides of the geoboard.) Do you see any patterns? Is there a rule?

How many squares (of all sizes) can you find on a checkerboard? Is there a pattern?

(1.03, 3.01, 5.03)

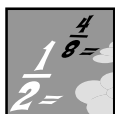


## Using Numbers in Powerful Ways

Use your ruler to draw a quadrilateral, a pentagon, and a hexagon, each with a perimeter of exactly 30 centimeters. Explain what you did in completing this task.



(3.01)



## Fraction Fun



Mrs. Allen gave some peanuts to her children to take to the zoo. Zach got half the peanuts, Wendy got a one-fourth of what was left. The twins, Ron and Don shared the remaining peanuts. If Ron got 45 peanuts, how many peanuts did Mrs. Allen have to give her children?

(1.03)



## For Further Study

How many years would be in the following: olympiad, decade, score, century, millennium? How often would events occur if they are described as the following: annual, biannual, semiannual, semicentennial, centennial?

# Decimal Dynamo

(Your Goal: the smallest sum of 6 products)

Directions:

1. Roll 4 number cubes (or one cube 4 times). Use these numbers to create a 2-digit number and a whole number with a decimal. For example,

6 4 2 5      62 and 5.4      or      46 and 2.5

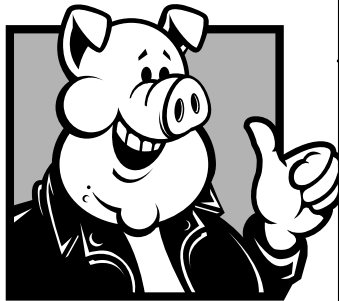
Record the numbers you create for each round.

2. Multiply these numbers and record the product for each round.
3. At the end of 6 rounds, add the products.

The winner is the player with the smallest sum of the 6 products.

Variation: The winner with the greatest sum.

	X
Round 1 Product →	
	X
Round 2 Product →	
	X
Round 3 Product →	
	X
Round 4 Product →	
	X
Round 5 Product →	
	X
Round 6 Product →	



	X
Round 1 Product →	
	X
Round 2 Product →	
	X
Round 3 Product →	
	X
Round 4 Product →	
	X
Round 5 Product →	
	X
Round 6 Product →	



## Keeping Skills Sharp

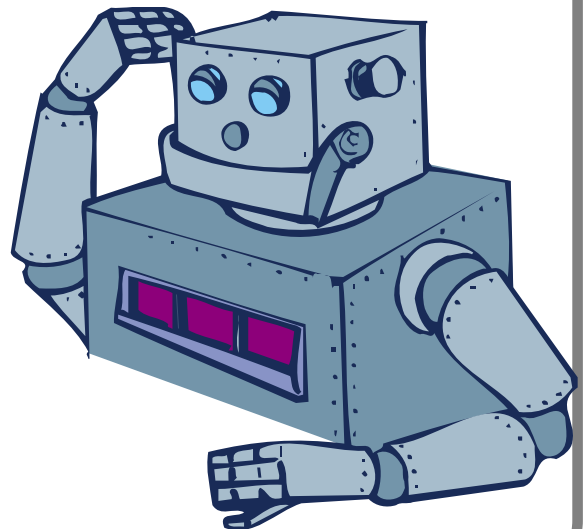
1.  $4\frac{1}{2}$  times 2 plus 10 =
2. \$ 83.00 - \$ 21.49
3. If there are 5280 feet in a mile, how many feet are in 8 miles?
4. Nearest thousand to: 682,921
5. What year is one century after 1876?
6. If you have 3 different shirts and 4 different pairs of pants, how many possible outfits do you have?
7.  $986 \div 27$
8. Lara made four trips to Raleigh. Each trip took a different amount of time. If these were the times for the trip, how many hours did she spend driving to Raleigh? 78min, 85min, 95min, 72min.



## Solve this!

Waldo had some problems to solve. He did 10 of them on the first page. There were 6 problems on the second page. He did a third of the problems on the second page, leaving 8 more to do from both pages. How many problems were on the first page?

(1.03)





# To the Teacher ..

Grade 5

WEEK  
29

**Investigations:** The number of squares on a geoboard is 30. This is found easiest by looking for a pattern. There are sixteen  $1 \times 1$  squares, nine  $2 \times 2$ 's, four  $3 \times 3$ 's and one  $4 \times 4$ . Students should discover the perfect squares and then easily make the connection for the number of squares on a checkerboard.

## For Further Study:

Olympiad: 4 years      Annual: yearly      Decade: 10 years  
Score: 20 years      Century: 100 years      Millennium: 1000 years  
Centennial: every 100 years  
Semicentennial: every 50 years  
Biannual: twice a year (not evenly spaced)  
Semiannual (twice a year equally spaced; every six months)

## SolveThis:

14 problems on the first page.

## Fraction Fun:

360 peanuts

## Mental Math

Directions to Students: Number your paper from 1 to 10. Write your answers as the questions are called out. Each question will be repeated only once.

1.  $(7 \times 7 - 1) \div 8$
2.  $(65 - 30) \div 7 \times 6$
3. Is  $5/6 - 2/6$  greater than  $1/3$ ?
4. Nearest whole number to:  $4 \frac{1}{6}$
5. Product of first 3 odd numbers
6. Name of a  $90^\circ$  angle
7. Grams in 2000 milligrams
8. Ounces in 2 cups
9. Hours in 75 minutes
10. Which is longer, cm or in?

## Keeping Skills Sharp

1. 19
2. \$ 61.51
3. 42,240 feet
4. three
5. 1976
6.  $3 \times 4 = 12$  outfits
7.  $36 \div 14$
8. 5 and a half hours





## Math Trivia

The moon's distance from the Earth is about 240,000 miles, which is about 30 times the diameter of the Earth. The moon travels at an orbital speed of about 0.6 miles per second, and its period of rotation is 27.3 days. What questions could be answered with these data?



## Using Numbers in Powerful Ways

Play "Mystery in the Back" game. Your teacher will put a number or vocabulary word on your back. Try to guess the number by asking only "yes" or "no" questions to other students in class. You may only ask each student one question. Stand in the front of the room when you have solved the "Mystery" on your back!



(1.03)



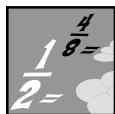
## Investigations

(3.04)

Research reveals that some rectangles are more pleasing to the eye than others. Divide the class into working groups. Some students could do research on the **Golden Rectangle** and prepare an oral report and/or a bulletin board. Another group could collect data by asking which rectangles people prefer.

Draw some rectangles (ex.,  $1 \times 4$ ,  $2 \times 4$ ,  $3 \times 5$ ,  $2 \times 6$ , etc.) and survey people to see if one rectangle is more appealing than others. Keep colors constant since colors also affect visual preference. A third group of students could look for examples of rectangles that have the 3 to 5 ratio. (In advertisements note hands on a watch. If the 10 and 2 are corners of a rectangle formed with 8 and 4 at the other corners, would this rectangle be a golden one?

Be ready to discuss the findings of your investigative groups.



## Fraction Fun

Two thirds of a club voted for pizza as their favorite snack. One half of the other votes were for popcorn. The remaining votes were split evenly between candy and fruit. If fruit received five votes, how many are in the club? (1.03)



## For Further Study

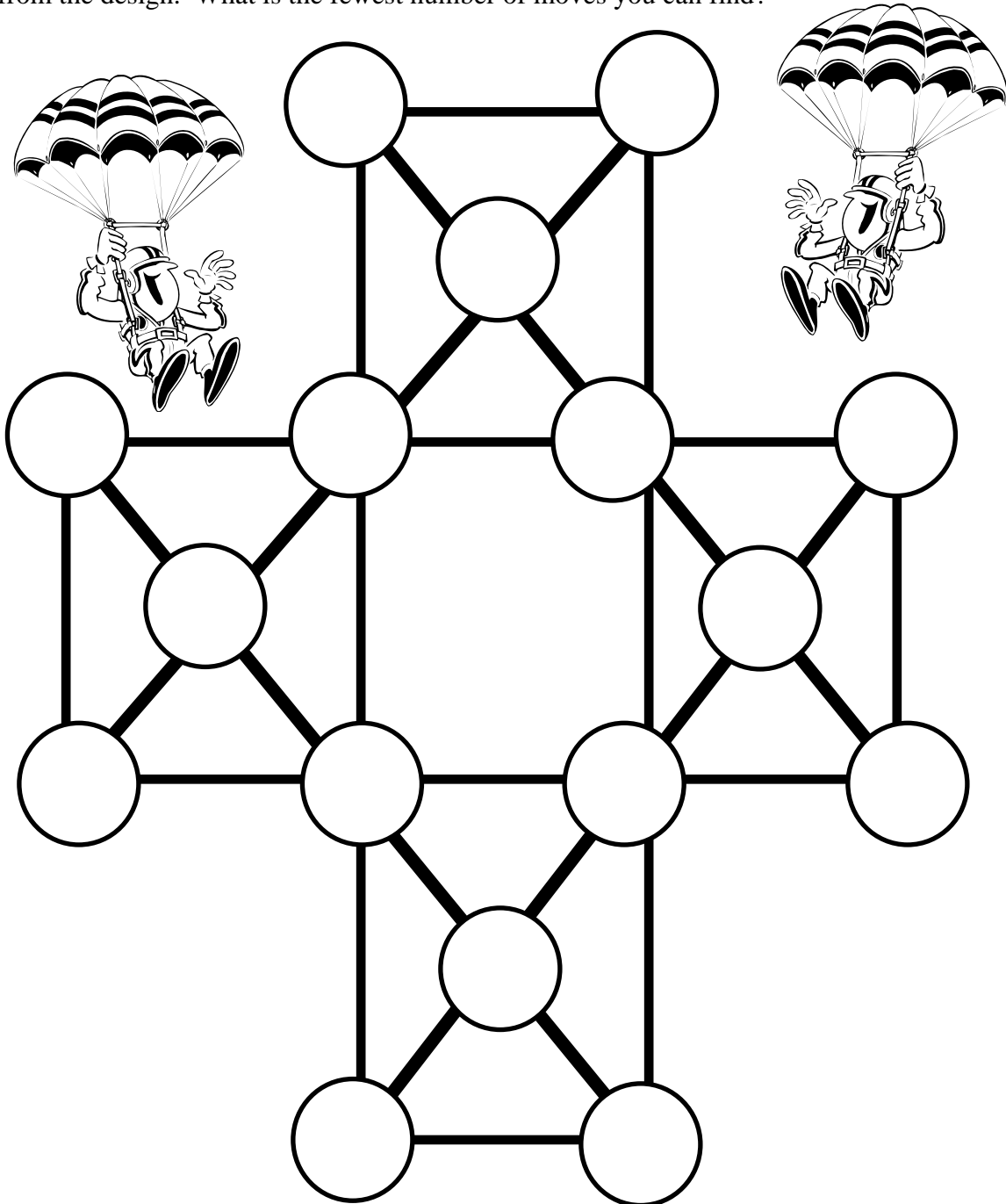
Starting at 8:30 a.m. each day, the school bell rings every 55 minutes. What time is it on the fourth ring?

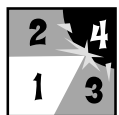
(1.03)

## Circle Down

Place a counter on each circle below, leaving one circle empty. Then try to remove all the counters but one in as few moves as possible. Moves are similar to checkers. They consist of jumping a counter over an adjacent counter in a straight line, landing in the empty circle beyond it. The counter that is jumped over is removed. A series of consecutive jumps with the same counter counts as a single move but they must always be in a straight line.

No matter which circle is empty at the start, it is possible to remove all but one of the counters from the design. What is the fewest number of moves you can find?





## Keeping Skills Sharp

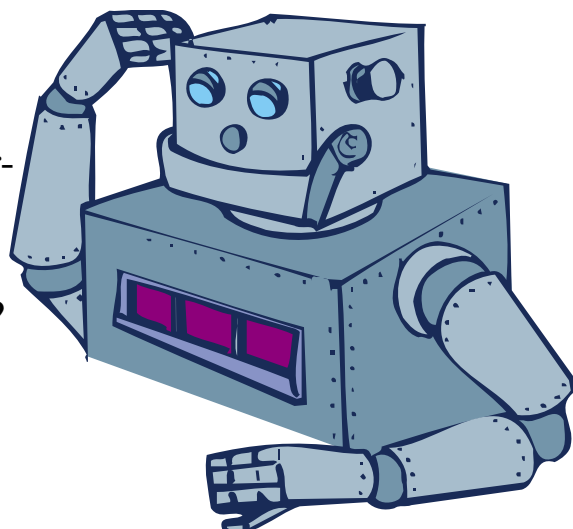
1.  $356 \times 451$
2.  $\frac{9}{10} + \frac{7}{10} + \frac{1}{10} > \frac{1}{2} + N$  Find two values for N.
3.  $4621 \div 50$
4. Write in a simpler form:  $\frac{6675}{8}$
5. Which part of a building is perpendicular to the floor?  
ceiling                      roof                      wall
6. Twenty students paid \$ 40 each for a camping trip. \$ 6.50 was returned to each student at the end of the trip. What was the final cost for each student?
7. What month is 10 months after July?
8.  $246 + n = 340$                        $n = ?$



## Solve this!

With the digits 1, 2, 3, and 4, how many four-digit numbers can be formed if no digits can be repeated?

What is the probability that a number is odd?  
is divisible by three?  
is greater than 500?



(1.03)



# To the Teacher ..

Grade 5

WEEK  
30

**Using Numbers In Powerful Ways:** Make cards with numbers and/or vocabulary words for students to guess after taping the paper on their backs. Try to have students to guess with as few guesses as possible.

**Solve This:** 24 numbers;  $\frac{1}{2}$ , 0, 1.

## Fraction Fun:

60 members

## Further Study:

12:10 PM

### Mental Math

Directions to Students: Number your paper from 1 to 10. Write your answers as the questions are called out. Each question will be repeated only once.

1.  $2 \times 2 \times 2 \times 5 + 2 \div 6$
2.  $95 - 50 \div 5 \times 7$
3. Expanded form for 3,603,003
4. Nearest whole number to: 10.37
5. Smallest multiple of 6 between 50 and 100
6. Name of triangle with 2 equal sides
7. Milliliters in a 2-liter bottle
8. Pounds in 40 ounces
9. Centuries in 350 years
10. Product of first 3 counting numbers

### Keeping Skills Sharp

1. 160,556
2. any number  $< 1.2$
3.  $92 \text{ r } 21$  or  $92 \frac{21}{50}$
4.  $834 \text{ r } 3$  or  $834 \frac{3}{8}$
5. wall
6. \$ 33.50
7. May
8. 94