

## Olympiad 1

1.

Suppose today is Tuesday. What day of the week will it be 100 days from now?

4 min.

2.

I have four 3¢-stamps and three 5¢-stamps. Using one or more of these stamps, how many different amounts of postage can I make?

5 min.

3.

Find the sum of the counting numbers from 1 to 25 inclusive. In other words, if  $S = 1 + 2 + 3 + \dots + 24 + 25$ , find the value of  $S$ .

5 min.

4.

In a stationery store, pencils have one price and pens have another price. Two pencils and three pens cost 78¢. But three pencils and two pens cost 72¢. How much does one pencil cost?

6 min.

5.

A work crew of 3 people requires 3 weeks and 2 days to do a certain job. How long would it take a work crew of 4 people to do the same job if each person of both crews works at the same rate as each of the others? Note: each week contains six work days.

5 min.

## Olympiad 2

1.

4 min.

A girl bought a dog for \$10, sold it for \$15, bought it back for \$20, and finally sold it for \$25. Did the girl make or lose money, and how much did she make or lose?

2.

5 min.

I have 30 coins consisting of nickels and quarters. The total value of the coins is \$4.10. How many of each kind do I have?

3.

5 min.

Rectangular cards, 2 inches by 3 inches, are cut from a rectangular sheet 2 feet by 3 feet. What is the greatest number of cards that can be cut from the sheet?

4.

5 min.

In three bowling games, Alice scores 139, 143, and 144. What score will Alice need in a fourth game in order to have an average score of 145 for all four games?

5.

6 min.

A book has 500 pages numbered 1, 2, 3, and so on. How many times does the digit 1 appear in the page numbers?

3

1.

4 min.

A set of marbles can be divided in equal shares among 2, 3, 4, 5, or 6 children with no marbles left over. What is the least number of marbles that the set could have?

2.

5 min.

A motorist made a 60-mile trip averaging 20 miles per hour. On the return trip, he averaged 30 miles per hour. What was the motorist's average speed for the entire trip?

3.

4 min.

The four-digit numeral 3AA1 is divisible by 9. What digit does A represent?

4.

7 min.

Express the following sum as a simple fraction in lowest terms.

$$\frac{1}{1 \times 2} + \frac{1}{2 \times 3} + \frac{1}{3 \times 4} + \frac{1}{4 \times 5} + \frac{1}{5 \times 6}$$

5.

5 min.

If we count by 3s starting with 1, the following sequence is obtained: 1, 4, 7, 10, ... . What is the 100th number in the sequence?

## Olympiad 4

1.

5 min.

100 pounds of chocolate is packaged into boxes each containing  $1\frac{1}{4}$  pounds of chocolate. Each box is then sold for \$1.75. What is the total selling price for all of the boxes of chocolate?

2.

5 min.

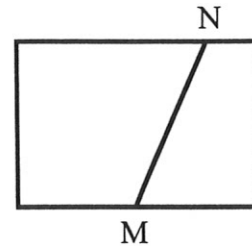
In the multiplication problem at the right, A and B stand for different digits. Find A and B.

$$\begin{array}{r} \phantom{\times} A B \\ \times B A \\ \hline \phantom{\times} 1 1 4 \\ 3 0 4 \\ \hline 3 1 5 4 \end{array}$$

3.

5 min.

In the rectangle at the right, line segment MN separates the rectangle into 2 sections. What is the largest number of sections into which the rectangle can be separated when 4 line segments are drawn through the rectangle?



4.

6 min.

If  $\frac{1}{3} = \frac{1}{A} + \frac{1}{B}$  where A and B are different whole numbers, find the value of A and the value of B.

5.

5 min.

P and Q represent numbers, and  $P * Q$  means  $\frac{P+Q}{2}$ . What is the value of  $3 * (6 * 8)$ ?

## Olympiad 5

1.

4 min.

The numbers 2, 4, 6, and 8 are a set of four consecutive even numbers. Suppose the sum of five consecutive even numbers is 320. What is the smallest of the five numbers?

2.

5 min.

Amy can mow 600 square yards of grass in  $1\frac{1}{2}$  hours. At this rate, how many minutes would it take her to mow 600 square feet?

3.

6 min.

Express the extended fraction at the right as a simple fraction in lowest terms.

$$\frac{1}{2 + \frac{1}{2 + \frac{1}{2 + \frac{1}{2}}}}$$

4.

5 min.

There are many numbers that divide 109 with a remainder of 4. List all two-digit numbers that have that property.

5.

6 min.

A dealer packages marbles in two different box sizes. One size holds 5 marbles and the other size holds 12 marbles. If the dealer packaged 99 marbles and used more than 10 boxes, how many boxes of each size did he use?

## Olympiad 6

1.

3 min.

X and Y are two different numbers selected from the first fifty counting numbers from 1 to 50 inclusive.

What is the largest value that  $\frac{X+Y}{X-Y}$  can have?

2.

5 min.

A chime clock strikes 1 chime at one o'clock, 2 chimes at two o'clock, 3 chimes at three o'clock, and so forth. What is the total number of chimes the clock will strike in a twelve-hour period?

3.

4 min.

The average of five weights is 13 grams. This set of five weights is then increased by another weight of 7 grams. What is the average of the six weights?

4.

6 min.

From a pile of 100 pennies(P), 100 nickels(N), and 100 dimes(D), select 21 coins which have a total value of exactly \$1.00. In your selection you must also use at least one coin of each type. How many coins of each of the three types(P,N,D) should be selected?

5.

5 min.

In a group of 30 high school students, 8 take French, 12 take Spanish and 3 take both languages. How many students of the group take neither French nor Spanish?

## Olympiad 7

1.

4 min.

A palimage of a natural number is the number that has the same digits as the given number but in reverse order. For example, 659 and 956 are palimages; so are 1327 and 7231. Now add 354 and its palimage. Call this sum X. Add X and its palimage. Call this sum Y. Add Y and its palimage. Call this sum Z. What is the value of Z?

2.

5 min.

A boy has the following seven coins in his pocket: 2 pennies, 2 nickels, 2 dimes, and 1 quarter. He takes out two coins, records the sum of their values, and then puts them back with the other coins. He continues to take out two coins, record the sum of their values, and put them back. How many different sums can he record at most?

3.

4 min.

Suppose all the counting numbers are arranged in columns as shown at the right. Under what column-letter will 1000 appear?

A	B	C	D	E	F	G
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	_	_

4.

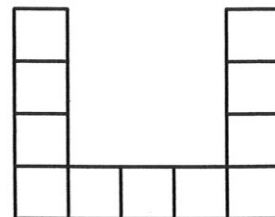
4 min.

Twelve people purchased supplies for a ten-day camping trip with the understanding that each of the twelve will get equal daily shares. They are then joined by three more people, but make no further purchases. How long will the supplies then last if the original daily share for each person is not changed?

5.

5 min.

The U-shaped figure at the right contains 11 squares of the same size. The area of the U-shaped figure is 176 square inches. How many inches are in the perimeter of the U-shaped figure?



## Olympiad 8

1.

4 min.

A bag contains 500 beads, each of the same size, but in 5 different colors. Suppose there are 100 beads of each color and I am blindfolded. What is the fewest number of beads I must pick to be absolutely sure there are 5 beads of the same color among the beads I have picked blindfolded?

2.

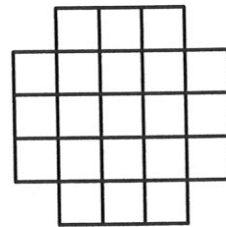
5 min.

If 20 is added to one-third of a number, the result is the double of the number. What is the number?

3.

5 min.

Each of the boxes in the figure at the right is a square. How many different squares can be traced using the lines in the figure?



4.

5 min.

A woman spent two-thirds of her money. She lost two-thirds of the remainder and then had \$4 left. With how much money did she start?

5.

5 min.

If a number ends in zeros, the zeros are called *terminal zeros*. For example, 520,000 has four terminal zeros, but 502,000 has just three terminal zeros. Let  $N$  equal the product of all natural numbers from 1 through 20:

$$N = 1 \times 2 \times 3 \times 4 \times \cdots \times 20.$$

How many terminal zeros will  $N$  have when it is written in standard form?