

SET 2 OLYMPIAD 1

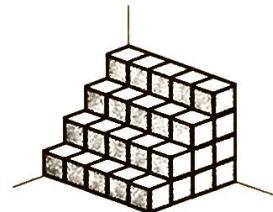
1A
3 min.
80%

What is the value of the following?

$$9 + 91 + 18 + 82 + 27 + 73 + 36 + 64 + 45 + 55$$

1B
4 min.
79%

The stairway at the right is made by placing identical cubes on top of each other. Not all cubes are visible. How many cubes does this stairway contain?



1C
5 min.
59%

Linda wants to buy 20 crayons. *ToyWorld* sells crayons at 4 for 25 cents, and *GameLand* sells crayons at 5 for 30 cents. Which of the two stores sells 20 crayons for less, and by how many cents less?

1D
3 min.
30%

In a class of 26 students, 15 like vanilla ice cream and 16 like chocolate ice cream. However, 3 do not like either flavor. How many students like both vanilla and chocolate ice cream?

1E
5 min.
23%

The average weight of a group of children is 100 pounds. Todd, who weighs 112 pounds, then joins the group. This raises the average weight of the group to 102 pounds. How many children were in the original group?

SET 2 OLYMPIAD 2

2A
4 min.
35%

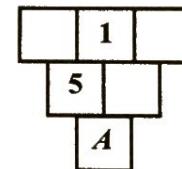
Ana divides the number N by 8 correctly and gets .25 as her answer. Barney multiplies the same number N by 8. What answer should he get?

2B
5 min.
51%

Sherry has five times as many computer games as Jay. Nairan has three times as many computer games as Jay. Sherry has 16 computer games more than Nairan has. How many computer games does Jay have?

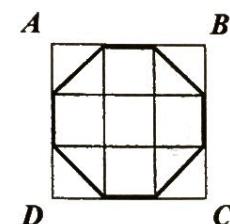
2C
5 min.
50%

Each square contains one of the numbers 1, 2, 3, 4, 5, or 6 and each number is used once. Except for the top row, the number in each square is the difference of the numbers in the two squares above it. What number is in the square marked A ?



2D
5 min.
44%

Square $ABCD$ is composed of nine congruent squares as shown. The area of the shaded region is 14 square centimeters. What is the area of square $ABCD$, in sq cm?



2E
6 min.
38%

When two people shake hands with one another, that counts as one “handshake.” Every person in a room shakes hands with each other person in the room exactly once. There are a total of 15 “handshakes”. How many people are in the room?

SET 2 OLYMPIAD 3

3A
5 min.
54%

N is a number such that $1 \times 2 \times 3 \times 4 \times 5 \times 6 \times 7 = 8 \times 9 \times 10 \times N$.
What is the value of N ?

3B
3 min.
66%

What number between 121 and 149 is exactly divisible by both 3 and 5?

3C
5 min.
50%

Rachel left home for school at 7:45 one morning. She returned home at 4:05 that afternoon. How many hours and minutes was she gone?
(The number of minutes in your answer must be less than 60.)

3D
6 min.
15%

The area of a square is 36 square centimeters. A rectangle has the same perimeter as the square. The length of the rectangle is twice its width.
What is the area of the rectangle in square cm?

3E
7 min.
26%

Each row of *'s has two more *'s than the row immediately above it, as shown. Altogether, how many *'s are contained in the first twenty rows?

*
* * *
* * * * *
* * * * * * * *
and so on.

SET 2 OLYMPIAD 4

4A
5 min.
39%

The number 6 has exactly four different factors: 1, 2, 3, and 6. How many counting numbers less than 15 have exactly two different factors?

4B
5 min.
14%

The scale drawing of a rectangular room measures 10 cm long by 6 cm wide. The actual width of the room is 15 feet. What is the actual perimeter of the room, in feet?

4C
5 min.
9%

2^n means that 2 is used as a factor n times. For example, 2^4 means $2 \times 2 \times 2 \times 2 = 16$. We say that 2^4 ends in 6 and that 2^4 has a units digit of 6. If 2^{1997} is multiplied out, what is the units (ones) digit of the product?

4D
5 min.
55%

At a special sale, all shirts sell at one price and all caps sell at another price. Kathy pays \$30 for 3 shirts and 2 caps. Marc pays \$23 for 1 shirt and 5 caps. For how many dollars does each shirt sell?

4E
6 min.
40%

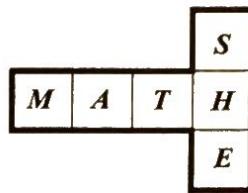
Maria writes the same whole number in each box below and gets a true statement. Jon does the same as Maria and also gets a true statement. But Jon and Maria choose different numbers. What two numbers do they choose?

$$12 + (\square \times \square) - (7 \times \square) = 0$$

SET 2 OLYMPIAD 5

5A
3 min.
78%

The figure at the right is cut out on the thick outer lines and folded on the thin inner lines to form a cube. Which letter will be on the face of the cube opposite the letter *T*?



5B
5 min.
60%

Trini is 1 month older than Billy. Jason is 3 months older than Billy. Kimberly is 4 months older than Jason. How much older than Trini is Kimberly, in months?

5C
6 min.
44%

In this subtraction, the boxes contain the digits 3, 4, 6, and 9 in some order and the circles contain the digits 4, 5, 8, and 9 in some order. What four-digit number is represented by the boxes?

$$\begin{array}{r}
 \square\square\square \\
 - \circ\circ\circ\circ \\
 \hline
 3\ 4\ 9\ 7
 \end{array}$$

5D
5 min.
13%

A walkway (the shaded region) is built around a rectangular pool, as shown. The pool is 20 feet by 30 feet. The walkway is completely tiled with whole square tiles 2 feet by 2 feet. What is the fewest number of tiles that can be used?



5E
5 min.
32%

Alexandra gives $\frac{1}{2}$ of her marbles to Tyler, who gives $\frac{2}{3}$ of what he receives to Jan, who gives $\frac{3}{4}$ of what she receives to Jerry. If each has a counting number of marbles, what is the fewest number of marbles that Alexandra could have started with?

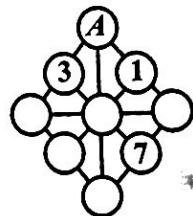
SET 3 OLYMPIAD 1

1A
3 min.
74%

If $82 + 18 + 83 + 17 + 84 + 16 + 85 + 15 + 71 + N = 500$, what is the value of the counting number N ?

1B
5 min.
33%

Each whole number from 1 to 9 is placed in a circle so that the sum of the three numbers along any straight line is the same as the sum along any other straight line. Which number must be in the circle marked A ?



1C
5 min.
33%

Pat reads 1 page of a certain novel every Monday, 2 pages every Tuesday, 3 pages every Wednesday, and so on up to 7 pages every Sunday. She reads every page exactly once and does not skip any days. Suppose Pat starts reading page 1 on a Monday and reads the pages in order. On which day of the week does she read page 100?

1D
6 min.
8%

In all, how many counting numbers from 200 to 500 are divisible by all of the following:

2, 3, 4, 5, and 6?

1E
6 min.
10%

A circle and a triangle overlap as shown. The area of the circle is three times the area of the triangle. If the common region is removed, then the area of the rest of the circle would be 14 square centimeters more than the area of the rest of the triangle. What is the area of the complete triangle, in sq cm?



SET 3 OLYMPIAD 2

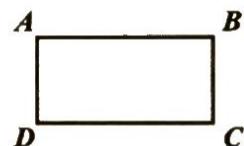
2A
3 min.
78%

What is the value of the following?

$$123 + 123 + 123 + 123 + 123 + \\ 123 + 123 + 123 + 123 + 123 + \\ 123 + 123 + 123 + 123 + 123 + \\ 123 + 123 + 123 + 123 + 123$$

2B
5 min.
26%

Lee walks along the edges of a rectangular pool (shown) from point *A* to *B* to *C* to *D*, a distance of 38 meters. Marina walks along the edges of the same pool from *B* to *C* to *D* to *A*, a distance of 31 meters. What is the perimeter of the pool, in meters?



2C
5 min.
7%

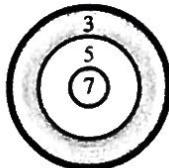
Terry drives 20 miles at an average rate of 50 miles per hour while Sherry drives 20 miles at an average rate of 40 miles per hour. Neither person stops. Terry needs *M* fewer minutes to complete the trip than Sherry does. What is the value of *M*?

2D
6 min.
56%

At the Math Store each circle costs one amount and each square costs another amount. Five circles plus one square cost 20¢. Two circles plus three squares cost 21¢. At these prices, how many cents does twelve circles plus five squares cost?

2E
7 min.
7%

Fifteen darts have landed on the dartboard shown. Each dart scores 3, 5, or 7 points. In how many different ways can the fifteen darts score a total of 75 points?



SET 3 OLYMPIAD 3

3A
4 min.
14%

Lauren is the youngest of four sisters. The average of their ages (all different whole numbers) is 9 years. What is the oldest that Lauren can be, in years?

3B
5 min.
15%

The six-digit number $63X904$ is an even multiple of 27. What digit does X represent?

3C
6 min.
23%

Michelle's Number Recycling Machine obeys exactly two rules:

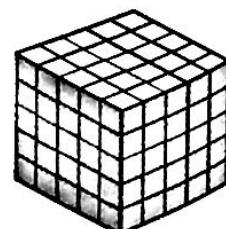
- If an inserted number has exactly 1 digit, double the number.*
 - If an inserted number has exactly 2 digits, compute the sum of the digits.*
- The first number Michelle inserts is 1. Then every answer she gets is inserted back into the machine until fifty numbers are inserted. What is the fiftieth number to be inserted?

3D
6 min.
48%

Name three consecutive numbers, each less than 100, such that the smallest is divisible by 6, the next is divisible by 5 and the largest is divisible by 4.
(Note: Consecutive numbers are whole numbers that follow in order. An example is 4, 5, 6, 7, 8.)

3E
6 min.
7%

A large cube, 5 cm by 5 cm by 5 cm, is painted orange on all six faces. Then it is cut into 125 small cubes, each 1 cm by 1 cm by 1 cm. How many of the small cubes are *not* painted orange on any face?



SET 3 OLYMPIAD 4

4A

3 min.
29%

What is the last year in the twentieth century which is divisible by 37?

4B

6 min.
30%

In a “Tribonacci Sequence,” each number after the third number is the sum of the preceding three numbers. For example, if the first three numbers are 5, 6, and 7, then the fourth number is 18 because $5 + 6 + 7 = 18$ and the fifth number is 31 because $6 + 7 + 18 = 31$. The first five numbers of another Tribonacci Sequence are P , Q , 86, 158, and 291 in that order. What is the value of P ?

4C

5 min.
13%

Kim was elected class president. She received 3 votes for every 2 that Amy got. No one else ran. However, if 8 of the people who voted for Kim had voted for Amy instead, Kim would have received only 1 vote for every 2 that Amy would have gotten. How many people voted?

4D

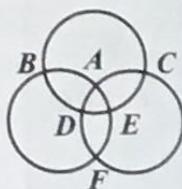
6 min.
7%

Alma has a set of stones. Each weighs a whole number of ounces. By choosing the appropriate stones from the set, she can make any whole number of ounces from 1 to 31 ounces, inclusive. What is the fewest number of stones that Alma can have?

4E

7 min.
1%

Three circular streets intersect at points A , B , C , D , E , and F as shown. How many different paths can be walked along the streets from A to F , if no intersection is entered more than once when walking each path?



SET 3 OLYMPIAD 5

5A
5 min.
56%

This morning Allen had 2 more action figures than Barbara, and Barbara had 8 more action figures than Charlie. Allen gave some of his action figures to Charlie, and now both Allen and Charlie have the same number of action figures. Barbara now has N more action figures than Charlie does. What is the value of N ?

5B
5 min.
39%

Frank read nine consecutive pages from a certain book. The sum of the page numbers he read is 378. What is the page number of the middle page he read?

5C
6 min.
8%

Tanya forms her sequence by starting with the number 2 and adding 3 continuously. She gets the following: 2, 5, 8, 11, 14, and so on. Joe forms his sequence by starting with the number N (not 2) and adding the number D (not 3) continuously. His second number is 9 and his fifth number is 21. What is his 1000th number?

5D
5 min.
4%

In the multiplication example, different letters represent different non-zero digits and a blank space may represent any digit. What are *both* correct values for the three-digit product DDD ?

$$\begin{array}{r} AB \\ \times CD \\ \hline \end{array}$$

$$\begin{array}{r} \\ \\ \hline \end{array}$$

$$\begin{array}{r} \\ \\ \hline DDD \end{array}$$

5E
7 min.
11%

Candy and Sandy compete in more than one event. No one else competes. In each event, the winner gets the counting number of points W and the loser gets the smaller counting number of points L . There are no ties. Candy wins the competition by a score of 22 to 13. If Sandy wins exactly one event, what is the value of W ?

SET 4 OLYMPIAD 1

1A
4 min.
28%

For how many different counting numbers between 10 and 200 is the sum of the digits equal to 6, if zero is not a digit of any of the numbers?

1B.
5 min.
17%

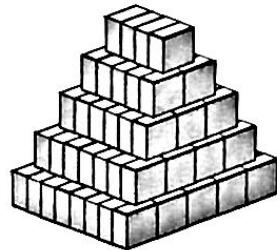
The perimeter of a rectangle is 26 units. Each side is measured in counting numbers. What is the greatest possible area of the rectangle, in square units?

1C
5 min.
5%

Bryan can buy candy canes at 4 for 50¢ and can sell them at 3 for 50¢. How many canes must Bryan sell in order to make a profit of \$5.00?

1D
5 min.
58%

A supermarket clerk makes a solid pyramid out of identical cereal boxes. The top five layers are shown. What is the total number of cereal boxes in these top five layers?



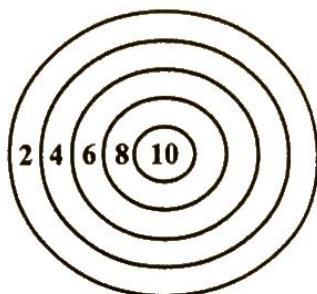
1E
6 min.
52%

A normal duck has two legs. A lame duck has one leg. A sitting duck has no legs. Donald has 33 ducks. He has two more normal ducks than lame ducks and two more lame ducks than sitting ducks. How many legs in all do the 33 ducks have?

SET 4 OLYMPIAD 2

2A
5 min.
49%

Roberta throws five darts at the target shown. Each dart lands in a region of the target, scoring the points shown. Of the following total scores, list all that are *not* possible:



6, 14, 17, 38, 42, 58

2B
4 min.
40%

Kelly made two purchases. She gave one cashier \$20 for a compact disc and received \$6 change. Then she gave another cashier \$15 for a bracelet and received \$3 change. After these purchases she had \$28. How many dollars did she have before buying the compact disc and the bracelet?

2C
5 min.
22%

On a 100 cm measuring stick, marks are made at 19, N , and 99 cm, from left to right. The distance between the marks at N and 99 cm is three times the distance between the marks at N and 19 cm. What number is N ?

2D
5 min.
24%

A cube has 6 faces: top, bottom, and all 4 sides. The object shown is made of six congruent cubes. Not all faces are visible. All outer faces of the object including the bottom are painted blue. How many faces of the cubes are painted blue?



2E
7 min.
4%

Assume that a post office issues only 3¢ and 8¢ stamps and all postage is in whole numbers of cents. What is the greatest amount of postage in cents which *cannot* be made using only 3¢ and 8¢ stamps?

SET 4 OLYMPIAD 3

3A
4 min.
43%

Suppose Sandy writes every whole number from 1 to 100 without skipping any numbers. How many times will Sandy write the digit “2”?

3B
4 min.
76%

Paul has half as many pieces of candy as Jennifer. Jennifer has half as many as Charles. Charles has 12 times as many as Susan. Susan has 4 pieces. How many pieces do Charles and Paul have altogether?

3C
5 min.
5%

Consider all pairs of counting numbers whose sum is less than 11. The two members of a pair could be either the same as each other or different. How many different products are possible if the two numbers are multiplied?

3D
6 min.
29%

Mary and Kevin each have a rectangular garden whose area is 36 square meters. Each side is measured in whole meters. Mary’s garden is 1 m wider than Kevin’s garden, but Kevin’s garden is 3 m longer than Mary’s garden. How wide is Mary’s garden, in meters?

3E
7 min.
23%

Main Street has eight traffic lights. Each shows green for 2 minutes, then switches to another color. The traffic lights turn green 10 seconds apart, from the first light to the eighth light. From the time that the first light turns green until it switches to another color, for how long will all eight lights show green at the same time, in seconds?

SET 4 OLYMPIAD 4

4A
4 min.
31%

Each of PQ and RS represents a 2-digit number. Different letters represent different digits, chosen from 6, 7, 8, and 9. What is the greatest product that $PQ \times RS$ can have?

4B
4 min.
44%

Exactly 10 disks are in a bowl. Each is marked with a different counting number selected from 1 through 10. Gina and Monique each selects 5 disks. Two of Gina's disks are marked 2 and 8. Two of Monique's disks are marked 7 and 9. What is the largest sum that Gina's disks can have?

4C
5 min.
13%

A “fast” clock gains time at the same rate every hour. It is set to the correct time at 10 AM. When the fast clock shows 11 AM the same day, the correct time is 10:52 AM. When the fast clock shows 3:30 PM that day, what is the correct time?

4D
6 min.
25%

All counting numbers are arranged in the triangular pattern as shown by the first four rows. What is the first number in the 13th row?

1						
2	3	4				
5	6	7	8	9		
10	11	12	13	14	15	16

...and so on.

4E
6 min.
46%

A 14-digit number N is created by writing 8 as both the first and last digits and then placing the 3-digit number 793 between the two 8s four times. What is the remainder when N is divided by 7?

SET 4 OLYMPIAD 5

5A
4 min.
67%

In this addition different letters represents different digits. What digits do A , B , C , and D represent?

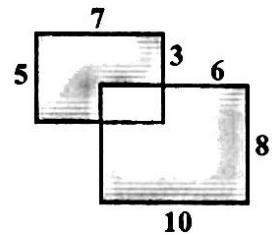
$$\begin{array}{r}
 6 B 5 2 \\
 9 C 4 \\
 + A 3 7 D \\
 \hline
 1 1 1 1 1
 \end{array}$$

5B
4 min.
58%

Each of AB and BA represents a two-digit number having the same digits, but in reverse order. If the difference of the two numbers is 54 and $A + B = 10$, find both numbers, AB and BA .

5C
5 min.
10%

As shown, the length of each segment in the overlapping rectangles is given, in cm. Find the sum of the areas of the shaded regions, in sq cm.



5D
6 min.
11%

How many different counting numbers less than 200 are exactly divisible by either 6 or 9 or by both?

5E
6 min.
4%

In the number 203,500, the last two zeroes are called *terminal zeroes*. The zero after the digit 2 is not a terminal zero. How many terminal zeroes does the product of the first 30 counting numbers ($1 \times 2 \times 3 \times \dots \times 30$) have?