

SET 14

OLYMPIAD 1

1A
3 MINUTES
60%

25 digits are shown. Find the sum of the digits.

$$\begin{array}{r} 2\ 2\ 2\ 2 \\ 2\ 2\ 6\ 2 \\ 2\ 6\ 6\ 2 \\ 6\ 6\ 6\ 2 \\ 4\ 4\ 4\ 4 \\ 4\ 4\ 4\ 4\ 4 \end{array}$$

1B
4 MINUTES
51%

How many quarters (worth 25 cents each) must be added to 12 nickels (worth 5 cents each), so that the average value of a coin in the new enlarged collection is 10 cents?

1C
5 MINUTES
8%

How many different sums can be obtained by adding two different integers chosen from the set below?

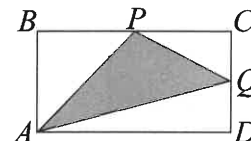
$$\{-12, -11, -10, \dots, +6, +7, +8\}$$

1D
5 MINUTES
9%

561 is the product of 3 different prime numbers. How many factors of 561 are not prime?

1E
7 MINUTES
15%

In rectangle $ABCD$, P is the midpoint of side \overline{BC} and Q is the midpoint of \overline{CD} . The area of $\triangle APQ$ is what fractional part of the area of rectangle $ABCD$?



Solutions start on page 264.

SET 14

OLYMPIAD 2

2A
3 MINUTES
50%

Write as a single decimal:

$$1 - \frac{2}{10} + \frac{3}{100} - \frac{4}{1000}$$

2B
4 MINUTES
74%

Amy picks a whole number, squares it and then subtracts 1. She gives her final number to Brian. Brian adds 3 to the number Amy gave him and then doubles that result. Brian's final result is 54. With what number did Amy start?

2C
6 MINUTES
45%

Alex, Bruno, and Charles each add the lengths of two sides of the same triangle correctly. They get 27 cm, 35 cm, and 32 cm, respectively. Find the perimeter of the triangle, in cm.

2D
6 MINUTES
37%.

The first three terms in a sequence are: 1, 2, 3. Each term after that is the opposite of the sum of the three previous terms. For example, the 4th term is -6 (the opposite of $1 + 2 + 3$), and the 5th term is 1. What is the 99th term?

2E
7 MINUTES
40%

Find the whole number value of

$$\sqrt{1+3+5+\dots+45+47+49}$$

Solutions start on page 266.

SET 14

OLYMPIAD 3

3A
4 MINUTES
60%

When Isaac opens a book, the product of the page numbers on the open pages is 420. Find the sum of the two page numbers.

3B
5 MINUTES
45%

A squirrel buries a total of 80 acorns in N holes. Find the greatest possible value of N , provided:

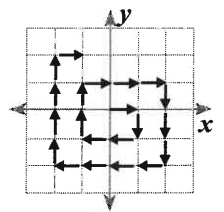
- (1) No hole is empty, and
- (2) No two holes contain the same number of acorns.

3C
5 MINUTES
27%

The sum of a proper fraction in lowest terms and its reciprocal equals $2\frac{4}{15}$. Find the original proper fraction.

3D
7 MINUTES
21%

The picture shows a “spiral” that begins at the origin $(0,0)$ and passes through every lattice point in the plane. Each small arrow is 1 unit in length. Following the “spiral”, what is the length of the path from the origin to the point $(5,3)$?



3E
7 MINUTES
15%

How many degrees are in the angle formed by the hands of a clock at 8:24?



Solutions start on page 268

SET 14

OLYMPIAD 4

4A
4 MINUTES
43%

Some students are in a line. Abby is in the center of the line. Sara is 3 places in front of her, Eli is 4 places behind Sara, and Kayla is 2 places in front of Eli. Kayla is the third person in line. How many students are in the line?

4B
4 MINUTES
35%

Given the data: 3, 6, 6, 8, 10, 12. Express in lowest terms:

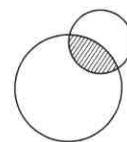
$$\frac{3 \times \text{median} - \text{mode}}{6 \times \text{mean}}$$

4C
4 MINUTES
50%

Find the integer that exceeds -5 by the same amount that $+13$ exceeds -1 .

4D
6 MINUTES
13%

A circle with radius 5 centimeters intersects a circle with radius 3 cm as shown. The area of the shaded region is $\frac{7\pi}{2}$ square centimeters. Find the total combined area inside the circles, but outside the shaded region. Leave your answer in terms of π .



4E
7 MINUTES
6%

How many different triangles can be formed whose 3 vertices are chosen from the rectangular array of 8 points shown?



Solutions start on page 270.

SET 14

OLYMPIAD 5

5A
4 MINUTES
60%

How many 2-digit numbers are there in which the ones digit is greater than the tens digit?

5B
5 MINUTES
45%

A bank has two plans for checking accounts. In plan A, the charge is \$7.50 a month with no fee for each check. In plan B, the charge is \$3 a month plus an additional 20 cents for each check written. What is the least number of checks a customer must write each month so that plan A costs less than plan B?

5C
5 MINUTES
27%

Suppose the base of a triangle is increased by 20%, and its height is increased by 30%. By what percent is the area of the triangle increased?

5D
6 MINUTES
21%

Starting with 1, Sara lists the counting numbers in order but omits all those that use the digit 9. What is the 300th number on her list?

5E
7 MINUTES
15%

Line segments form a path that starts at $(0,0)$, is drawn to $(1,0)$, and then to $(1,2)$. Each new segment forms a right angle with the previous segment and is 1 unit longer than that segment. The path ends at $(0,0)$. How many segments are in the shortest possible path?

(Hint: Consider horizontal and vertical segments separately.)

Solutions start on page 272.