

# 1989 AJHSME Problems

## Problem 1

$$(1 + 11 + 21 + 31 + 41) + (9 + 19 + 29 + 39 + 49) =$$

- (A) 150    (B) 199    (C) 200    (D) 249    (E) 250

## Problem 2

$$\frac{2}{10} + \frac{4}{100} + \frac{6}{1000} =$$

- (A) .012    (B) .0246    (C) .12    (D) .246    (E) 246

## Problem 3

Which of the following numbers is the largest?

- (A) .99    (B) .9099    (C) .9    (D) .909    (E) .9009

## Problem 4

Estimate to determine which of the following numbers is closest to  $\frac{401}{205}$ .

- (A) .2    (B) 2    (C) 20    (D) 200    (E) 2000

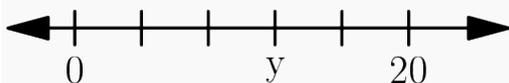
## Problem 5

$$-15 + 9 \times (6 \div 3) =$$

- (A) -48    (B) -12    (C) -3    (D) 3    (E) 12

## Problem 6

If the markings on the number line are equally spaced, what is the number  $y$ ?



(A) 3    (B) 10    (C) 12    (D) 15    (E) 16

### Problem 7

If the value of 20 quarters and 10 dimes equals the value of 10 quarters and  $n$  dimes, then  $n =$

(A) 10    (B) 20    (C) 30    (D) 35    (E) 45

### Problem 8

$$(2 \times 3 \times 4) \left( \frac{1}{2} + \frac{1}{3} + \frac{1}{4} \right) =$$

(A) 1    (B) 3    (C) 9    (D) 24    (E) 26

### Problem 9

There are 2 boys for every 3 girls in Ms. Johnson's math class. If there are 30 students in her class, what percent of them are boys?

(A) 12%    (B) 20%    (C) 40%    (D) 60%    (E)  $66\frac{2}{3}\%$

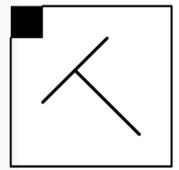
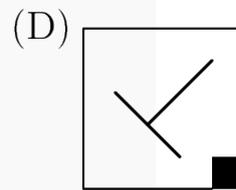
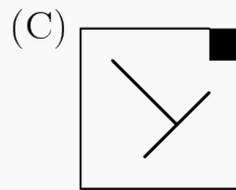
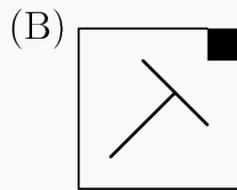
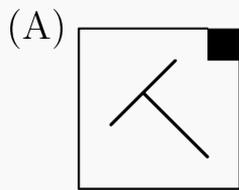
### Problem 10

What is the number of degrees in the smaller angle between the hour hand and the minute hand on a clock that reads seven o'clock?

(A)  $50^\circ$     (B)  $120^\circ$     (C)  $135^\circ$     (D)  $150^\circ$     (E)  $165^\circ$

### Problem 11

Which of the five "T-like shapes" would be symmetric to the one shown with respect to the dashed line?



### Problem 12

$$\frac{1 - \frac{1}{3}}{1 - \frac{1}{2}} =$$

- (A)  $\frac{1}{3}$     (B)  $\frac{2}{3}$     (C)  $\frac{3}{4}$     (D)  $\frac{3}{2}$     (E)  $\frac{4}{3}$

### Problem 13

$$\frac{9}{7 \times 53} =$$

- (A)  $\frac{.9}{.7 \times 53}$     (B)  $\frac{.9}{.7 \times .53}$     (C)  $\frac{.9}{.7 \times 5.3}$     (D)  $\frac{.9}{7 \times .53}$     (E)  $\frac{.09}{.07 \times .53}$

### Problem 14

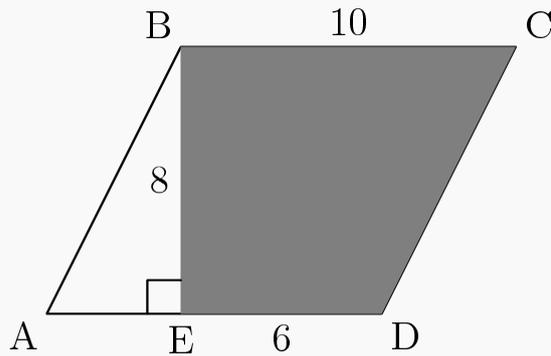
When placing each of the digits 2, 4, 5, 6, 9 in exactly one of the boxes of this subtraction problem, what is the smallest difference that is possible?

- (A) 58    (B) 123    (C) 149    (D) 171    (E) 176

$$\begin{array}{r} \square \quad \square \quad \square \\ - \quad \square \quad \square \\ \hline \end{array}$$

### Problem 15

The area of the shaded region BEDC in parallelogram ABCD is



- (A) 24    (B) 48    (C) 60    (D) 64    (E) 80

### Problem 16

In how many ways can 47 be written as the sum of two primes?

- (A) 0    (B) 1    (C) 2    (D) 3    (E) more than 3

### Problem 17

The number  $N$  is between 9 and 17. The average of 6, 10, and  $N$  could be

- (A) 8    (B) 10    (C) 12    (D) 14    (E) 16

### Problem 18

Many calculators have a reciprocal key  $\frac{1}{x}$  that replaces the current number

displayed with its reciprocal. For example, if the display is 00004 and the  $\frac{1}{x}$

key is pressed, then the display becomes 000.25. If 00032 is currently

displayed, what is the fewest positive number of times you must depress the  $\frac{1}{x}$

key so the display again reads 00032?

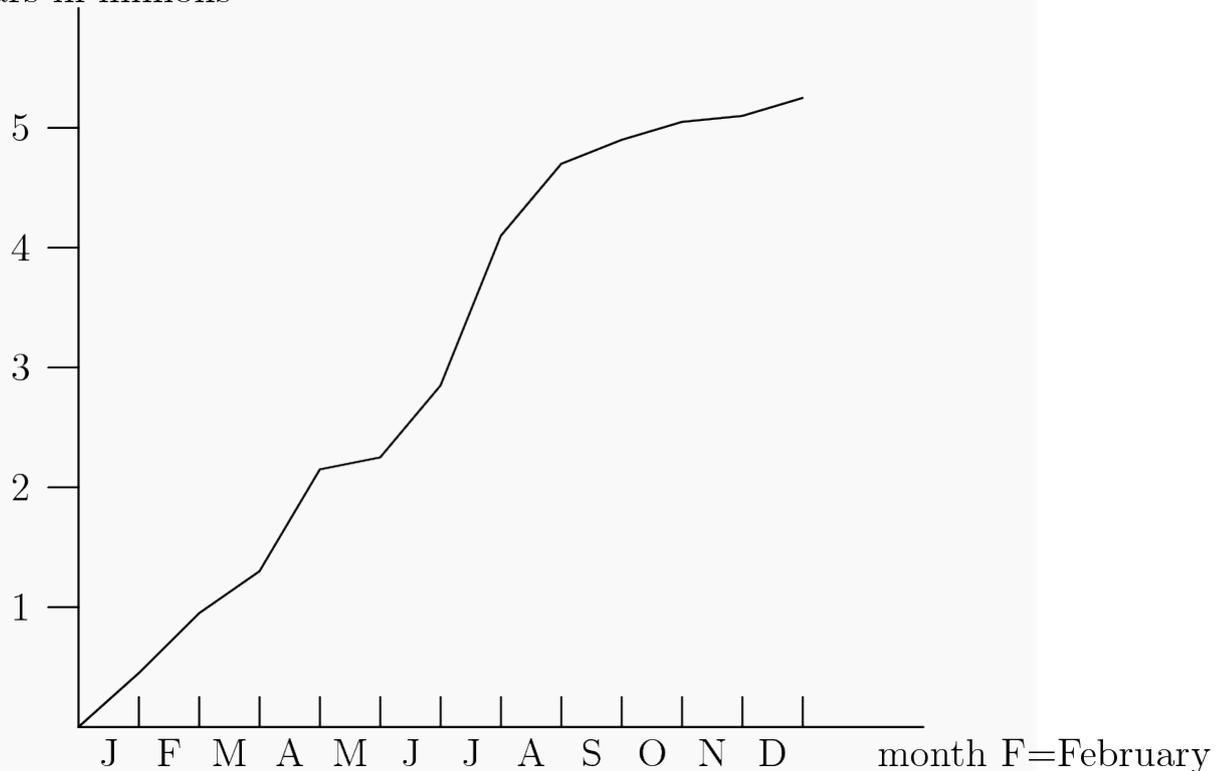
- (A) 1    (B) 2    (C) 3    (D) 4    (E) 5

## Problem 19

The graph below shows the total accumulated dollars (in millions) spent by the Surf City government during 1988. For example, about .5 million had been spent by the beginning of February and approximately 2 million by the end of April. Approximately how many millions of dollars were spent during the summer months of June, July, and August?

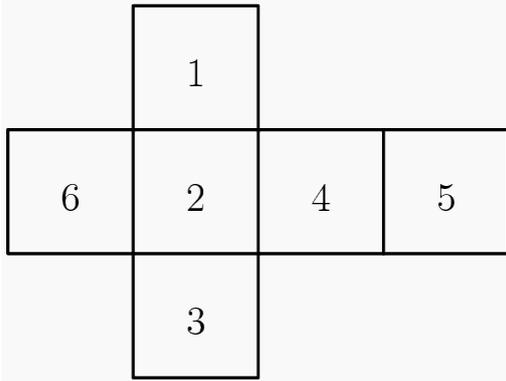
- (A) 1.5    (B) 2.5    (C) 3.5    (D) 4.5    (E) 5.5

dollars in millions



## Problem 20

The figure may be folded along the lines shown to form a number cube. Three number faces come together at each corner of the cube. What is the largest sum of three numbers whose faces come together at a corner?



- (A) 11    (B) 12    (C) 13    (D) 14    (E) 15

### Problem 21

Jack had a bag of 128 apples. He sold 25% of them to Jill. Next he sold 25% of those remaining to June. Of those apples still in his bag, he gave the shiniest one to his teacher. How many apples did Jack have then?

- (A) 7    (B) 63    (C) 65    (D) 71    (E) 111

### Problem 22

The letters A, J, H, S, M, E and the digits 1, 9, 8, 9 are "cycled" separately as

AJHSME    1989

1.    JHSMEA    9891
2.    HSMEAJ    8919
3.    SMEAJH    9198

follows and put together in a numbered list:    .....

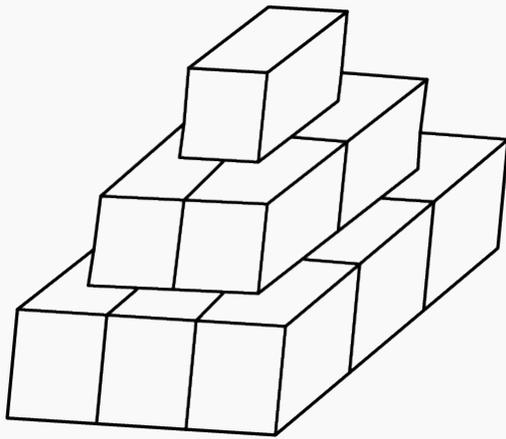
What is the number of the line on which AJHSME 1989 will appear for the first time?

- (A) 6    (B) 10    (C) 12    (D) 18    (E) 24

### Problem 23

An artist has 14 cubes, each with an edge of 1 meter. She stands them on the ground to form a sculpture as shown. She then paints the exposed surface of the sculpture. How many square meters does she paint?

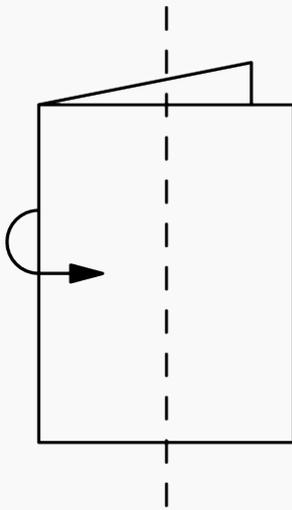
- (A) 21    (B) 24    (C) 33    (D) 37    (E) 42



### Problem 24

Suppose a square piece of paper is folded in half vertically. The folded paper is then cut in half along the dashed line. Three rectangles are formed—a large one and two small ones. What is the ratio of the perimeter of one of the small rectangles to the perimeter of the large rectangle?

- (A)  $\frac{1}{2}$     (B)  $\frac{2}{3}$     (C)  $\frac{3}{4}$     (D)  $\frac{4}{5}$     (E)  $\frac{5}{6}$



### Problem 25

Every time these two wheels are spun, two numbers are selected by the pointers. What is the probability that the sum of the two selected numbers is even?

- (A)  $\frac{1}{6}$     (B)  $\frac{3}{7}$     (C)  $\frac{1}{2}$     (D)  $\frac{2}{3}$     (E)  $\frac{5}{7}$

