

1990 AJHSME Problems

Problem 1

What is the smallest sum of two 3-digit numbers that can be obtained by placing each of the six digits 4, 5, 6, 7, 8, 9 in one of the six boxes in this addition problem?

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

- (A) 947 (B) 1037 (C) 1047 (D) 1056 (E) 1245

Solution

Problem 2

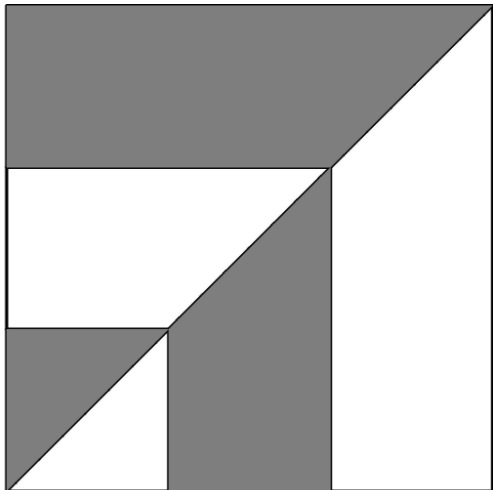
Which digit of .12345, when changed to 9, gives the largest number?

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

Solution

Problem 3

What fraction of the square is shaded?



- (A) $\frac{1}{3}$ (B) $\frac{2}{5}$ (C) $\frac{5}{12}$ (D) $\frac{3}{7}$ (E) $\frac{1}{2}$

Solution

Problem 4

Which of the following could **not** be the unit's digit [one's digit] of the square of a whole number?

- (A) 1 (B) 4 (C) 5 (D) 6 (E) 8

Solution

Problem 5

Which of the following is closest to the product $(.48017)(.48017)(.48017)$?

- (A) 0.011 (B) 0.110 (C) 1.10 (D) 11.0 (E) 110

Solution

Problem 6

Which of these five numbers is the largest?

- (A) $13579 + \frac{1}{2468}$ (B) $13579 - \frac{1}{2468}$ (C) $13579 \times \frac{1}{2468}$
(D) $13579 \div \frac{1}{2468}$ (E) 13579.2468

Solution

Problem 7

When three different numbers from the set $\{-3, -2, -1, 4, 5\}$ are multiplied, the largest possible product is

- (A) 10 (B) 20 (C) 30 (D) 40 (E) 60

Solution

Problem 8

A dress originally priced at 80 dollars was put on sale for 25% off. If 10% tax was added to the sale price, then the total selling price (in dollars) of the dress was

- (A) 45 dollars (B) 52 dollars (C) 54 dollars (D) 66 dollars (E) 68 dollars

Solution

Problem 9

The grading scale shown is used at Jones Junior High. The fifteen scores in Mr. Freeman's

class were: 89, 72, 54, 97, 77, 92, 85, 74, 75,
63, 84, 78, 71, 80, 90.

In Mr. Freeman's class, what percent of the students received a grade of C?

A:	93 - 100
B:	85 - 92
C:	75 - 84
D:	70 - 74
F:	0 - 69

- (A) 20% (B) 25% (C) 30% (D) $33\frac{1}{3}\%$ (E) 40%

Solution

Problem 10

On this monthly calendar, the date behind one of the letters is added to the date behind C. If this sum equals the sum of the dates behind A and B, then the letter is

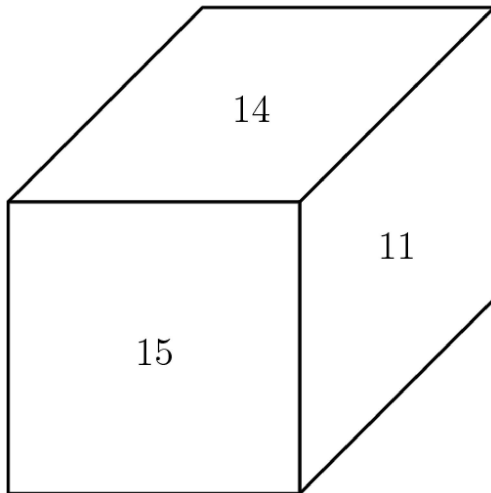
	Tues.	Wed.	Thurs.	Fri.	Sat.
			C	A	
			Q		
	S	B	P	T	R

- (A) P (B) Q (C) R (D) S (E) T

Solution

Problem 11

The numbers on the faces of this cube are consecutive whole numbers. The sums of the two numbers on each of the three pairs of opposite faces are equal. The sum of the six numbers on this cube is



- (A) 75 (B) 76 (C) 78 (D) 80 (E) 81

Solution

Problem 12

There are twenty-four 4-digit numbers that use each of the four digits 2, 4, 5, and 7 exactly once. Listed in numerical order from smallest to largest, the number in the 17th position in the list is

- (A) 4527 (B) 5724 (C) 5742 (D) 7245 (E) 7524

Solution

Problem 13

One proposal for new postage rates for a letter was 30 cents for the first ounce and 22 cents for each additional ounce (or fraction of an ounce). The postage for a letter weighing 4.5 ounces was

- (A) 96 cents (B) 1.07 dollars (C) 1.18 dollars (D) 1.20 dollars (E) 1.40 dollars

Solution

Problem 14

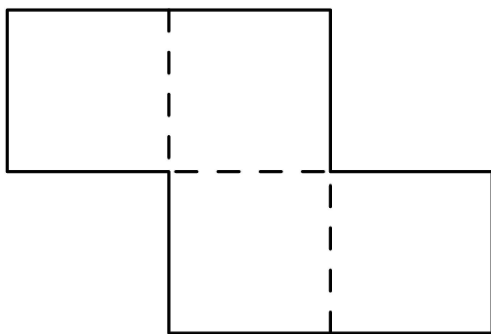
A bag contains only blue balls and green balls. There are 6 blue balls. If the probability of drawing a blue ball at random from this bag is $\frac{1}{4}$, then the number of green balls in the bag is

- (A) 12 (B) 18 (C) 24 (D) 30 (E) 36

Solution

Problem 15

The area of this figure is 100 cm^2 . Its perimeter is



[figure consists of four identical squares]

- (A) 20 cm (B) 25 cm (C) 30 cm (D) 40 cm (E) 50 cm

Solution

Problem 16

$$1990 - 1980 + 1970 - 1960 + \dots - 20 + 10 =$$

- (A) -990 (B) -10 (C) 990 (D) 1000 (E) 1990

Solution

Problem 17

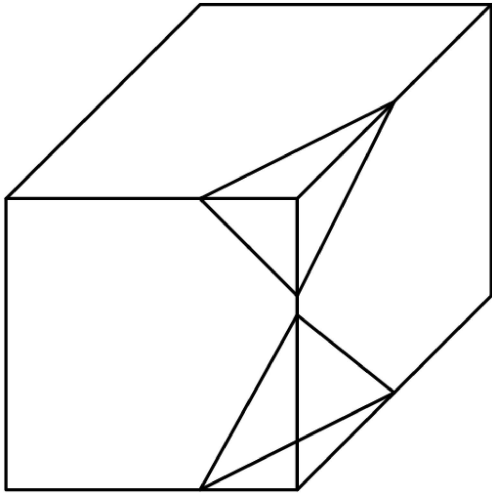
A straight concrete sidewalk is to be 3 feet wide, 60 feet long, and 3 inches thick. How many cubic yards of concrete must a contractor order for the sidewalk if concrete must be ordered in a whole number of cubic yards?

- (A) 2 (B) 5 (C) 12 (D) 20 (E) more than 20

Solution

Problem 18

Each corner of a rectangular prism is cut off. Two (of the eight) cuts are shown. How many edges does the new figure have?



- (A) 24 (B) 30 (C) 36 (D) 42 (E) 48

Assume that the planes cutting the prism do not intersect anywhere in or on the prism.

Solution

Problem 19

There are 120 seats in a row. What is the fewest number of seats that must be occupied so the next person to be seated must sit next to someone?

- (A) 30 (B) 40 (C) 41 (D) 60 (E) 119

Solution

Problem 20

The annual incomes of 1,000 families range from 8200 dollars to 98,000 dollars. In error, the largest income was entered on the computer as 980,000 dollars. The difference between the mean of the incorrect data and the mean of the actual data is

- (A) 882 dollars (B) 980 dollars (C) 1078 dollars (D) 482,000 dollars (E) 882,000 dollars

Solution

Problem 21

A list of 8 numbers is formed by beginning with two given numbers. Each new number in the list is the product of the two previous numbers. Find the first number if the last three are shown: ? , , , , , 16 , 64 , 1024

- (A) $\frac{1}{64}$ (B) $\frac{1}{4}$ (C) 1 (D) 2 (E) 4

Solution

Problem 22

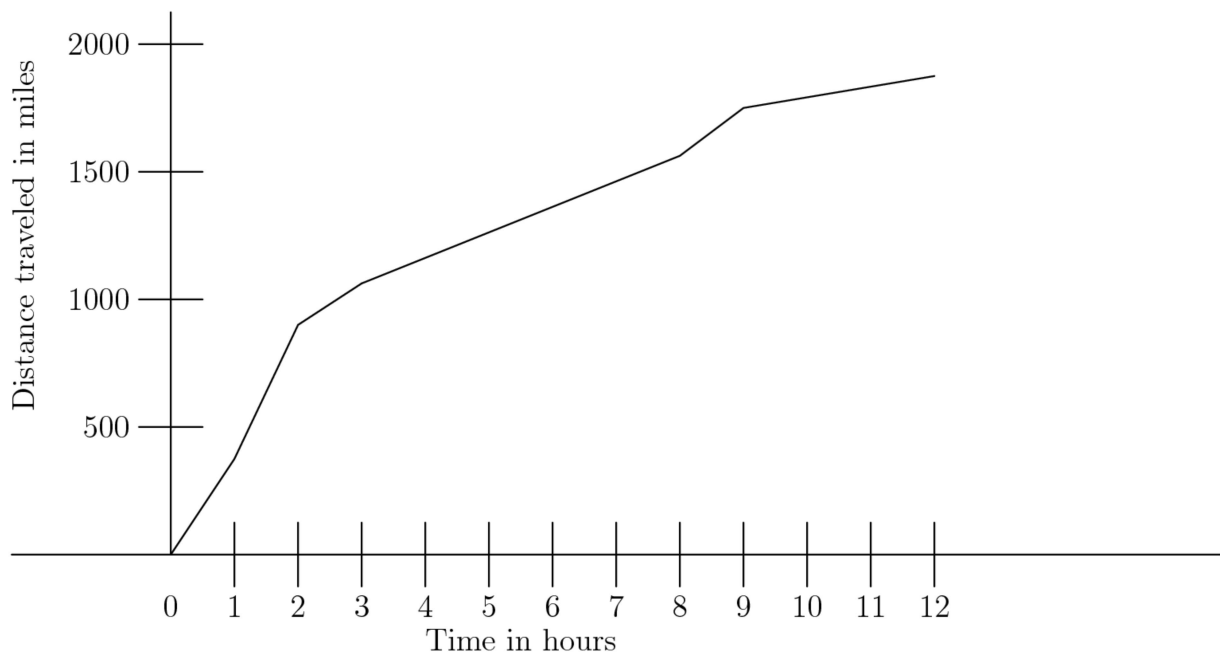
Several students are seated at a large circular table. They pass around a bag containing 100 pieces of candy. Each person receives the bag, takes one piece of candy and then passes the bag to the next person. If Chris takes the first and last piece of candy, then the number of students at the table could be

- (A) 10 (B) 11 (C) 19 (D) 20 (E) 25

Solution

Problem 23

The graph relates the distance traveled [in miles] to the time elapsed [in hours] on a trip taken by an experimental airplane. During which hour was the average speed of this airplane the largest?

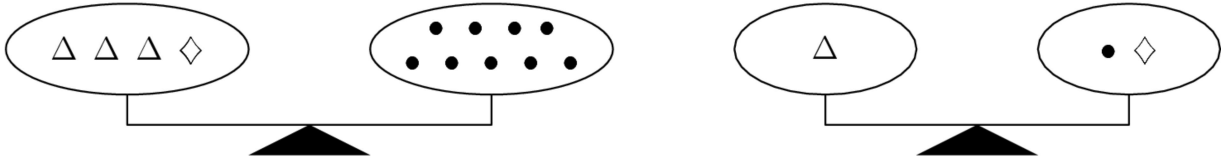


- (A) first (0-1) (B) second (1-2) (C) third (2-3) (D) ninth (8-9) (E) last (11-12)

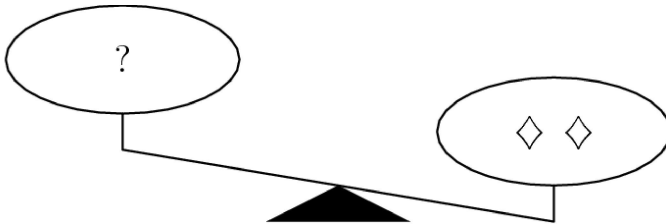
Solution

Problem 24

Three \triangle 's and a \diamond will balance nine \bullet 's. One \triangle will balance a \diamond and a \bullet .



How many \bullet 's will balance the two \diamond 's in this balance?



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

Solution

1990 AJHSME Answer Key

1. C
2. A
3. E
4. E
5. B
6. D
7. C
8. D
9. D
10. A
11. E
12. B
13. C
14. B
15. E
16. D
17. A
18. C
19. B
20. A
21. B
22. B
23. B
24. C
25. C