

1992 AJHSME Problems

Problem 1

$$\frac{10 - 9 + 8 - 7 + 6 - 5 + 4 - 3 + 2 - 1}{1 - 2 + 3 - 4 + 5 - 6 + 7 - 8 + 9} =$$

- (A) -1 (B) 1 (C) 5 (D) 9 (E) 10

Solution

Problem 2

Which of the following is not equal to $\frac{5}{4}$?

- (A) $\frac{10}{8}$ (B) $1\frac{1}{4}$ (C) $1\frac{3}{12}$ (D) $1\frac{1}{5}$ (E) $1\frac{10}{40}$

Solution

Problem 3

What is the largest difference that can be formed by subtracting two numbers chosen from the set $\{-16, -4, 0, 2, 4, 12\}$?

- (A) 10 (B) 12 (C) 16 (D) 28 (E) 48

Solution

Problem 4

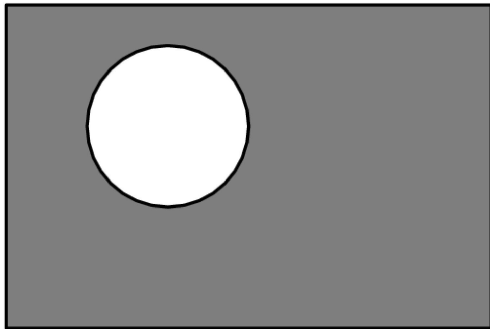
During the softball season, Judy had 35 hits. Among her hits were 1 home run, 1 triple and 5 doubles. The rest of her hits were singles. What percent of her hits were singles?

- (A) 28% (B) 35% (C) 70% (D) 75% (E) 80%

Solution

Problem 5

A circle of diameter 1 is removed from a 2×3 rectangle, as shown. Which whole number is closest to the area of the shaded region?



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

Solution

Problem 6

Suppose that $\begin{array}{c} a \\ \triangle \\ b \quad c \end{array}$ means $a + b - c$. For example, $\begin{array}{c} 5 \\ \triangle \\ 4 \quad 6 \end{array}$ is $5 + 4 - 6 = 3$. Then

the sum $\begin{array}{c} 1 \\ \triangle \\ 3 \quad 4 \end{array} + \begin{array}{c} 2 \\ \triangle \\ 5 \quad 6 \end{array}$ is

- (A) -2 (B) -1 (C) 0 (D) 1 (E) 2

Solution

Problem 7

The digit-sum of 998 is $9 + 9 + 8 = 26$. How many 3-digit whole numbers, whose digit-sum is 26, are even?

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

Solution

Problem 8

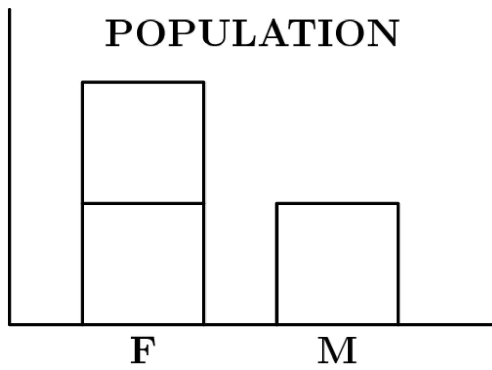
A store owner bought 1500 pencils at \$0.10 each. If he sells them for \$0.25 each, how many of them must he sell to make a profit of exactly \$100.00?

- (A) 400 (B) 667 (C) 1000 (D) 1500 (E) 1900

Solution

Problem 9

The population of a small town is 480. The graph indicates the number of females and males in the town, but the vertical scale-values are omitted. How many males live in the town?

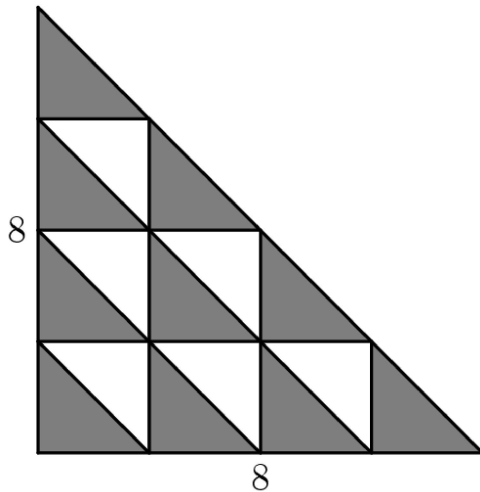


- (A) 120 (B) 160 (C) 200 (D) 240 (E) 360

Solution

Problem 10

An isosceles right triangle with legs of length 8 is partitioned into 16 congruent triangles as shown. The shaded area is

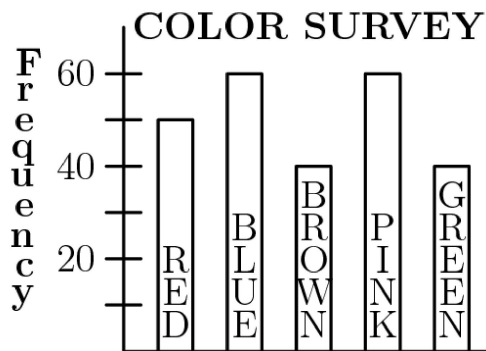


- (A) 10 (B) 20 (C) 32 (D) 40 (E) 64

Solution

Problem 11

The bar graph shows the results of a survey on color preferences. What percent preferred blue?



- (A) 20% (B) 24% (C) 30% (D) 36% (E) 42%

Solution

Problem 12

The five tires of a car (four road tires and a full-sized spare) were rotated so that each tire was used the same number of miles during the first 30,000 miles the car traveled. For how many miles was each tire used?

- (A) 6000 (B) 7500 (C) 24,000 (D) 30,000 (E) 37,500

Solution

Problem 13

Five test scores have a mean (average score) of 90, a median (middle score) of 91 and a mode (most frequent score) of 94. The sum of the two lowest test scores is

- (A) 170 (B) 171 (C) 176 (D) 177 (E) not determined by the information given

Solution

Problem 14

When four gallons are added to a tank that is one-third full, the tank is then one-half full. The capacity of the tank in gallons is

- (A) 8 (B) 12 (C) 20 (D) 24 (E) 48

Solution

Problem 15

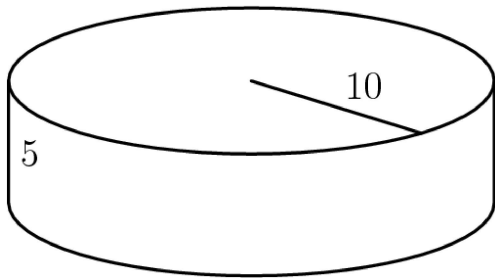
What is the 1992nd letter in this sequence?

ABCDED CBA ABCDED CBA ABCDED CBA ABCDED C...

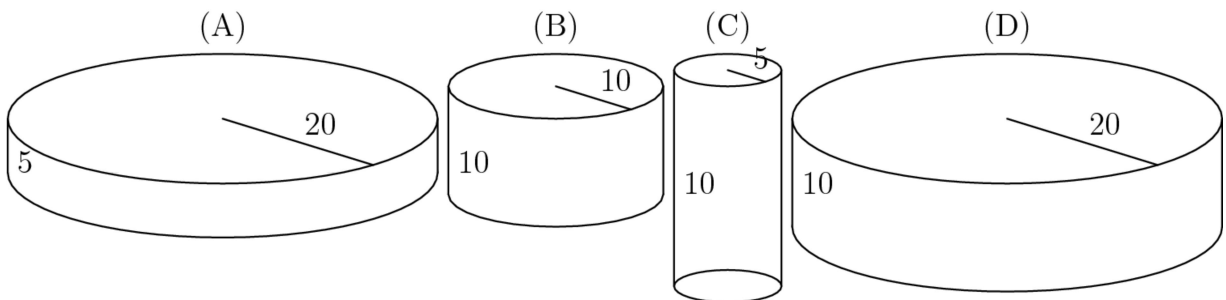
- (A) A (B) B (C) C (D) D (E) E

Solution

Problem 16



Which cylinder has twice the volume of the cylinder shown above?

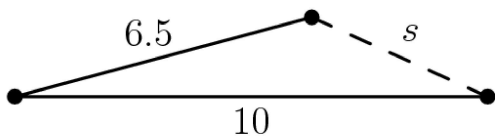


- (E) None of the above

Solution

Problem 17

The sides of a triangle have lengths 6.5, 10, and s , where s is a whole number. What is the smallest possible value of s ?



- (A) 3 (B) 4 (C) 5 (D) 6 (E) 7

Solution

Problem 18

On a trip, a car traveled 80 miles in an hour and a half, then was stopped in traffic for 30 minutes, then traveled 100 miles during the next 2 hours. What was the car's average speed in miles per hour for the 4-hour trip?

- (A) 45 (B) 50 (C) 60 (D) 75 (E) 90

Solution

Problem 19

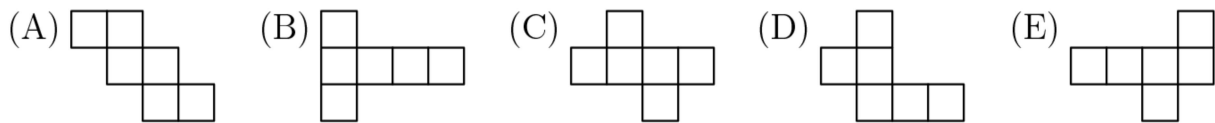
The distance between the 5th and 26th exits on an interstate highway is 118 miles. If any two exits are at least 5 miles apart, then what is the largest number of miles there can be between two consecutive exits that are between the 5th and 26th exits?

- (A) 8 (B) 13 (C) 18 (D) 47 (E) 98

Solution

Problem 20

Which pattern of identical squares could NOT be folded along the lines shown to form a cube?

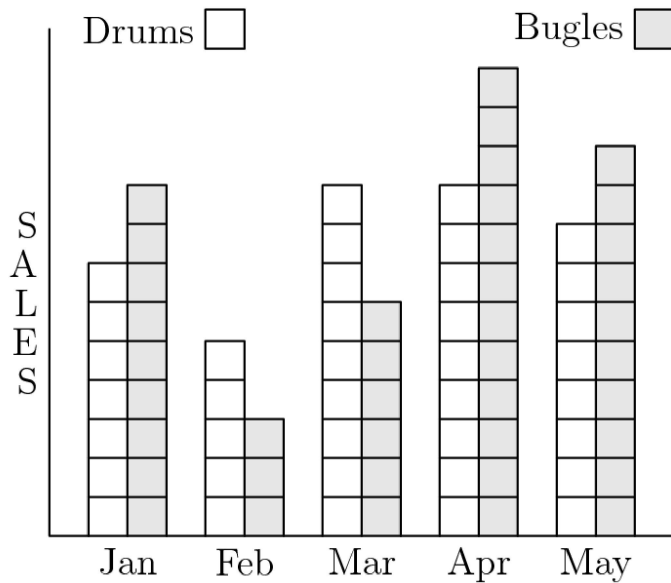


Solution

Problem 21

Northside's Drum and Bugle Corps raised money for a trip. The drummers and bugle players kept separate sales records. According to the double bar graph, in what month did one group's sales exceed the other's by the greatest percent?

MONTHLY SALES

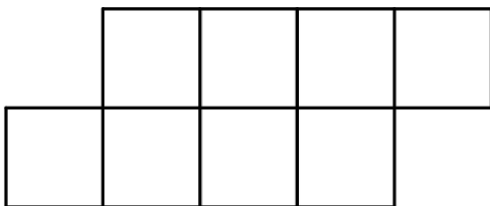


- (A) Jan (B) Feb (C) Mar (D) Apr (E) May

Solution

Problem 22

Eight 1×1 square tiles are arranged as shown so their outside edges form a polygon with a perimeter of 14 units. Two additional tiles of the same size are added to the figure so that at least one side of each tile is shared with a side of one of the squares in the original figure. Which of the following could be the perimeter of the new figure?



- (A) 15 (B) 17 (C) 18 (D) 19 (E) 20

Solution

Problem 23

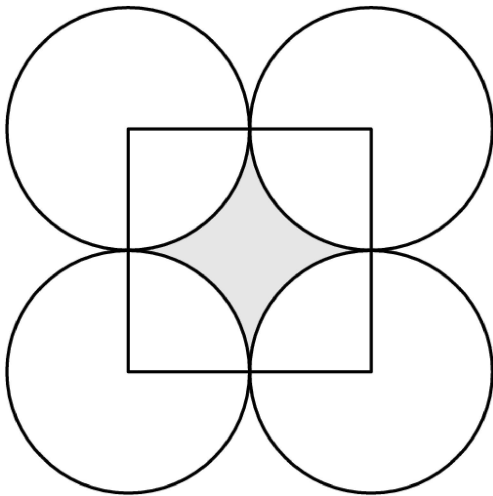
If two dice are tossed, the probability that the product of the numbers showing on the tops of the dice is greater than 10 is

- (A) $\frac{3}{7}$ (B) $\frac{17}{36}$ (C) $\frac{1}{2}$ (D) $\frac{5}{8}$ (E) $\frac{11}{12}$

Solution

Problem 24

Four circles of radius 3 are arranged as shown. Their centers are the vertices of a square. The area of the shaded region is closest to



- (A) 7.7 (B) 12.1 (C) 17.2 (D) 18 (E) 27

Solution

Problem 25

One half of the water is poured out of a full container. Then one third of the remainder is poured out. Continue the process: one fourth of the remainder for the third pouring, one fifth of the remainder for the fourth pouring, etc. After how many pourings does exactly one tenth of the original water remain?

- (A) 6 (B) 7 (C) 8 (D) 9 (E) 10

Solution

1992 AJHSME Answer Key

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