1987 AMC 8

Time limit: 40 minutes

Typeset by: LIVE by Po-Shen Loh
https://live.poshenloh.com/past-contests/amc8/1987

1. What is $.4 + .02 + .006$?

A $.012$

B $.066$

C $.12$

D $.24$

E $.426$

2. What is $\frac{2}{25}$ written as a decimal?

A $.008$

B $.08$

C $.8$

D 1.25

E 12.5

3. What is the value of

$$2(81+83+85+87+89+91+93+95+97+99)?$$

A 1600

B 1650

C 1700

D 1750

E 1800

4. Martians measure angles in clerts. There are 500 clerts in a full circle. How many clerts are there in a right angle?

A 90

B 100

C 125

D 180

E 250

5. A rectangular region is 0.4 m long and 0.22 m wide. What is its area, in square meters?

A $0.088\ \text{m}^2$

B $0.62\ \text{m}^2$

C $0.88\ \text{m}^2$

D $1.24\ \text{m}^2$

E $4.22\ \text{m}^2$

6. The smallest product one could obtain by multiplying two numbers in the set $\{-7, -5, -1, 1, 3\}$ is

A -35

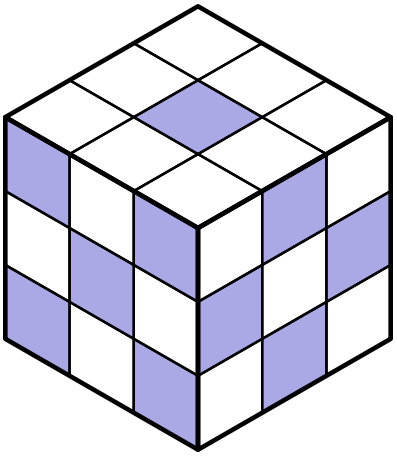
B -21

C -15

D -1

E 3

7. The large cube shown is made up of 27 identical sized smaller cubes. For each face of the large cube, the opposite face is shaded the same way. The total number of smaller cubes that must have at least one face shaded is



A 10

B 16

C 20

D 22

E 24

8. In the addition problem below, A and B are nonzero digits:

$$\begin{array}{r} 9876 \\ A32 \\ +B1 \\ \hline \end{array}$$

How many digits (not necessarily different) are in the sum of the three whole numbers?

A 4

B 5

C 6

D 9

E depends on the values of A and B

9. When finding the sum

$$\frac{1}{2}+\frac{1}{3}+\frac{1}{4}+\frac{1}{5}+\frac{1}{6}+\frac{1}{7},$$

what is the least common denominator used?

A 120

B 210

C 420

D 840

E 5040

10. What is the value of

$$4(299) + 3(299) + 2(299) + 298?$$

A 2889

B 2989

C 2991

D 2999

E 3009

11. The sum $2\frac{1}{7} + 3\frac{1}{2} + 5\frac{1}{19}$ is between which two values?

A 10 and $10\frac{1}{2}$

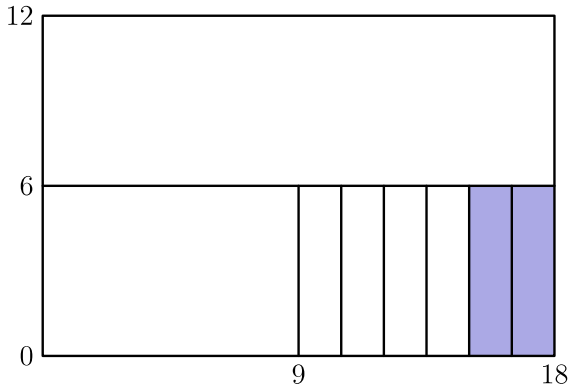
B $10\frac{1}{2}$ and 11

C 11 and $11\frac{1}{2}$

D $11\frac{1}{2}$ and 12

E 12 and $12\frac{1}{2}$

12. What fraction of the large 12 by 18 rectangular region is shaded?



A $\frac{1}{108}$

B $\frac{1}{18}$

C $\frac{1}{12}$

D $\frac{2}{9}$

E $\frac{1}{3}$

13. Which of the following fractions has the largest value?

A $\frac{3}{7}$

B $\frac{4}{9}$

C $\frac{17}{35}$

D $\frac{100}{201}$

E $\frac{151}{301}$

14. A computer can do $10{,}000$ additions per second. How many additions can it do in one hour?

A 6 million

B 36 million

C 60 million

D 216 million

E 360 million

15. A sale ad read: "Buy three tires at the regular price and get the fourth tire for $3." Sam paid $240 for a set of four tires at the sale. What was the regular price of one tire?

A $59.25

B $60

C $70

D $79

E $80

16. Joyce made 12 of her first 30 shots in the first three games of the basketball season, so her seasonal shooting average was 40%. In her next game, she took 10 shots and raised her seasonal shooting average to 50%. How many of these 10 shots did she make?

A 2

B 3

C 5

D 6

E 8

17. Abby, Bret, Carl, and Dana are seated in a row of four seats numbered 1 to 4. Joe looks at them and says: "Bret is next to Carl." "Abby is between Bret and Carl." However, each one of Joe's statements is false. Bret is actually sitting in seat 3. Who is sitting in seat 2?

A Abby

B Bret

C Carl

D Dana

E There is not enough information to be sure

18. Half the people in a room left. One third of those remaining started to dance. There were then 12 people who were not dancing. What was the original number of people in the room?

A 24

B 30

C 36

D 42

E 72

19. A calculator has a squaring key that replaces the number currently displayed with its square. For example, if the display reads 3 and the squaring key is pressed, the display becomes 9. If the display reads 2, how many times must the squaring key be pressed to produce a displayed number greater than 500?

A 4

B 5

C 8

D 9

E 250

20. Consider the statement: "If a whole number n is not prime, then the whole number $n-2$ is not prime." Which of the following values of n shows this statement to be false?

A 9

B 12

C 13

D 16

E 23

21. Suppose n^* means $\frac{1}{n}$, the reciprocal of n. For example, $5^* = \frac{1}{5}$. How many of the following four statements are true?

(i) $3^* + 6^* = 9^*$; (ii) $6^* - 4^* = 2^*$; (iii) $2^* \cdot 6^* = 12^*$; (iv) $10^* \div 2^* = 5^*$

A 0

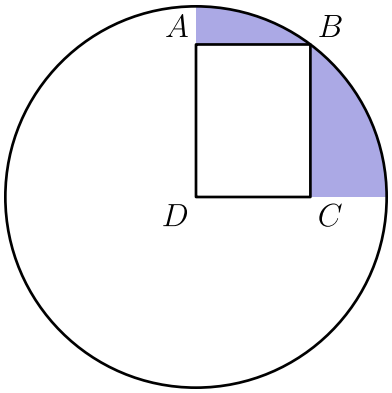
B 1

C 2

D 3

E 4

22. $ABCD$ is a rectangle, D is the center of the circle, and B is on the circle. If $AD = 4$ and $CD = 3$, then the area of the shaded region is between which two values?



A 4 and 5

B 5 and 6

C 6 and 7

D 7 and 8

E 8 and 9

23. In 1980, the U.S. Black population (in millions) was 5 in the Northeast, 5 in the Midwest, 15 in the South, and 2 in the West. To the nearest percent, what percent of the U.S. Black population lived in the South?

A 20%

B 25%

C 40%

D 56%

E 80%

24. A multiple choice examination consists of 20 questions. The scoring is $+5$ for each correct answer, -2 for each incorrect answer, and 0 for each unanswered question. John's score on the examination is 48. What is the maximum number of questions he could have answered correctly?

A 9

B 10

C 11

D 12

E 16

25. Ten balls numbered 1 to 10 are in a jar. Jack reaches into the jar and randomly removes one of the balls. Then Jill reaches into the jar and randomly removes a different ball. What is the probability that the sum of the two numbers on the balls removed is even?

A $\frac{4}{9}$

B $\frac{9}{19}$

C $\frac{1}{2}$

D $\frac{10}{19}$

E $\frac{5}{9}$

Solutions: https://live.poshenloh.com/past-contests/amc8/1987/solutions