

1993 AMC 8

Time limit: 40 minutes

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1. Which pair of numbers does **not** have a product equal to 36?

- A $\{-4, -9\}$
- B $\{-3, -12\}$
- C $\left\{\frac{1}{2}, -72\right\}$
- D $\{1, 36\}$
- E $\left\{\frac{3}{2}, 24\right\}$

2. When the fraction $\frac{49}{84}$ is expressed in simplest form, then the sum of the numerator and the denominator will be

- A 11
- B 17
- C 19
- D 33
- E 133

3. Which of the following numbers has the largest prime factor?

A 39

B 51

C 77

D 91

E 121

4. $1000 \times 1993 \times 0.1993 \times 10 =$

A 1.993×10^3

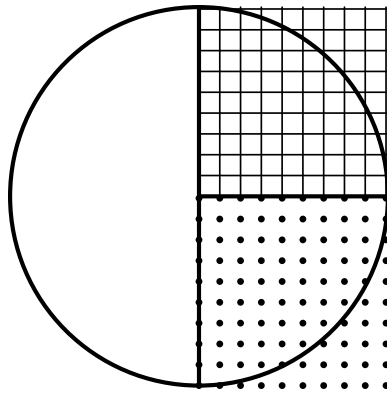
B 1993.1993

C $(199.3)^2$

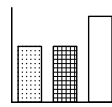
D 1,993,001.993

E $(1993)^2$

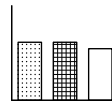
5. Which one of the following bar graphs could represent the data from the circle graph shown?



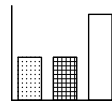
A



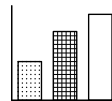
B



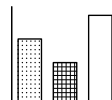
C



D



E



6. A can of soup can feed 3 adults or 5 children. If there are 5 cans of soup and 15 children are fed, then how many adults would the remaining soup feed?

- A 5
- B 6
- C 7
- D 8
- E 10

7. $3^3 + 3^3 + 3^3 =$

- A 3^4
- B 9^3
- C 3^9
- D 27^3
- E 3^{27}

8. To control her blood pressure, Jill's grandmother takes one half of a pill every other day. If one supply of medicine contains 60 pills, then the supply of medicine will last approximately

- A 1 month
- B 4 months
- C 6 months
- D 8 months
- E 1 year

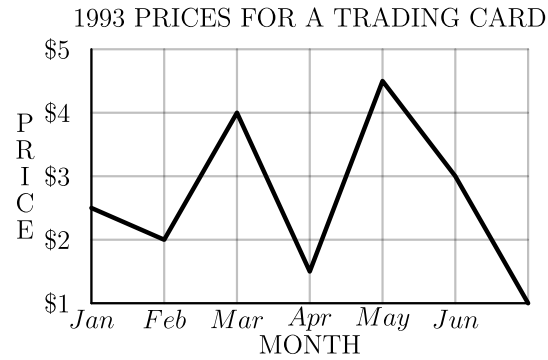
9. Consider the operation $*$ defined by the following table:

$*$	1	2	3	4
1	1	2	3	4
2	2	4	1	3
3	3	1	4	2
4	4	3	2	1

For example, $3 * 2 = 1$. Then $(2 * 4) * (1 * 3) =$

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

10. This line graph represents the price of a trading card during the first 6 months of 1993. The greatest monthly drop in price occurred during which month?



A January

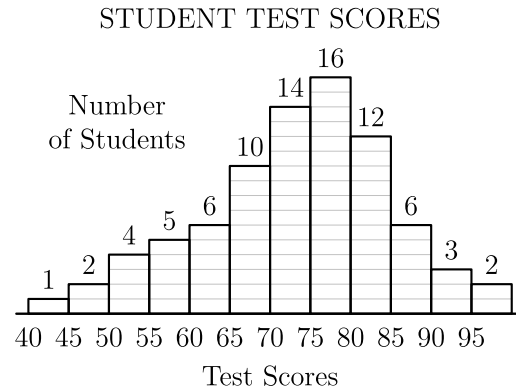
B March

C April

D May

E June

11. Consider this histogram of the scores for 81 students taking a test. The median is in the interval labeled which value?



- A 60
- B 65
- C 70
- D 75
- E 80

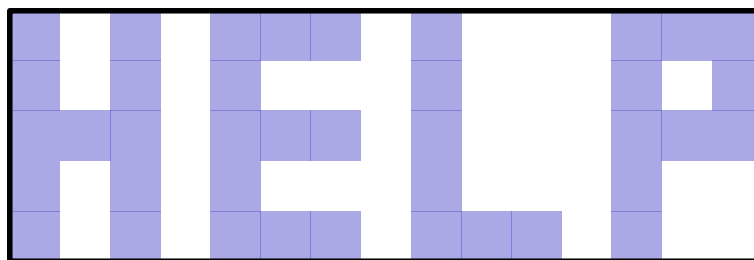
12. If each of the three operation signs, $+$, $-$, $\times$, is used exactly **once** in one of the blanks in the expression

$$5_4_6_3$$

then the value of the result could equal

- A 9
- B 10
- C 15
- D 16
- E 19

13. The word “**HELP**” in block letters is painted as a shaded region with strokes 1 unit wide on a 5 by 15 rectangular sign. Each letter is 3 units wide with a 1-unit gap between letters, as shown. The area of the unshaded portion of the sign, in square units, is



- A 30
- B 32
- C 34
- D 36
- E 38

14. The nine squares in the table shown are to be filled so that every row and every column contains each of the numbers 1, 2, 3. Then $A + B =$

1		
	2	A
		B

- A 2
- B 3
- C 4
- D 5
- E 6

15. The arithmetic mean (average) of four numbers is 85. If the largest of these numbers is 97, then the mean of the remaining three numbers is

- A 81.0
- B 82.7
- C 83.0
- D 84.0
- E 84.3

16. What is the value of the following expression?

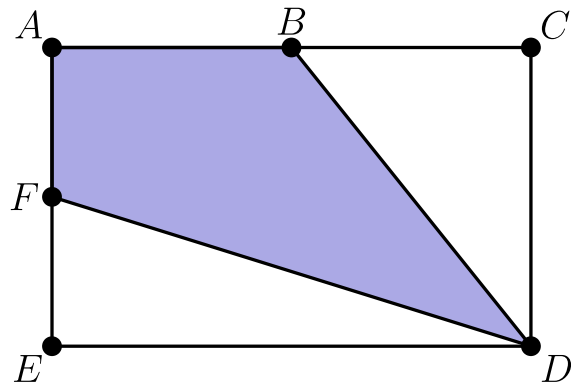
$$\frac{1}{1 + \frac{1}{2 + \frac{1}{3}}}$$

- A $\frac{1}{6}$
- B $\frac{3}{10}$
- C $\frac{7}{10}$
- D $\frac{5}{6}$
- E $\frac{10}{3}$

17. Square corners, 5 units on a side, are removed from a 20 unit by 30 unit rectangular sheet of cardboard. The sides are then folded to form an open box. The surface area, in square units, of the interior of the box is

- A 300
- B 500
- C 550
- D 600
- E 1000

18. The rectangle shown has length $AC = 32$, width $AE = 20$, and B and F are midpoints of $\overline{AC}$ and $\overline{AE}$, respectively. The area of the quadrilateral $ABDF$ is



A 320

B 325

C 330

D 335

E 340

19. What is the value of the following expression?

$$(1901 + 1902 + 1903 + \cdots + 1993) \\ - (101 + 102 + 103 + \cdots + 193)$$

A 167,400

B 172,050

C 181,071

D 199,300

E 362,142

20. When $10^{93} - 93$ is expressed as a single whole number, the sum of the digits is

A 10

B 93

C 819

D 826

E 833

21. If the length of a rectangle is increased by 20% and its width is increased by 50%, then the area is increased by

A 10%

B 30%

C 70%

D 80%

E 100%

22. Pat Peano has plenty of 0's, 1's, 3's, 4's, 5's, 6's, 7's, 8's and 9's, but he has only twenty-two 2's. How far can he number the pages of his scrapbook with these digits?

A 22

B 99

C 112

D 119

E 199

23. Five runners, P, Q, R, S, T , have a race, and P beats Q , P beats R , Q beats S , and T finishes after P and before Q . Who could **not** have finished third in the race?

- A P and Q
- B P and R
- C P and S
- D P and T
- E P, S and T

24. What number is directly above 142 in this array of numbers?

			1		
		2	3	4	
	5	6	7	8	9
10	11	12	...		

- A 99
- B 119
- C 120
- D 121
- E 122

25. A checkerboard consists of one-inch squares. A square card, 1.5 inches on a side, is placed on the board so that it covers part or all of the area of each of n squares. The maximum possible value of n is

- A 4 or 5
- B 6 or 7
- C 8 or 9
- D 10 or 11
- E 12 or more

Solutions: <https://live.poshenloh.com/past-contests/amc8/1993/solutions>

