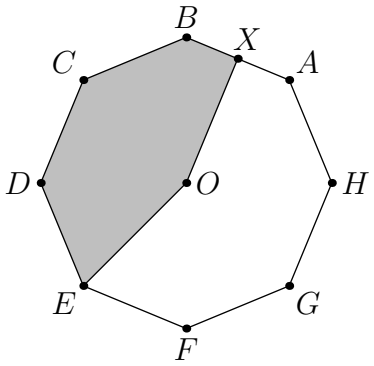
1 AMC 8 Problems

1. The longest professional tennis match ever played lasted a total of 11 hours and 5 minutes. How many minutes was this?

(A) 605 **(B)** 655 **(C)** 665 **(D)** 1005 **(E)** 1105

2. Point O is the center of the regular octagon $ABCDEFGH$, and X is the midpoint of the side $\overline{AB}$. What fraction of the area of the octagon is shaded?

(A) $\frac{11}{32}$ **(B)** $\frac{3}{8}$ **(C)** $\frac{13}{32}$ **(D)** $\frac{7}{16}$ **(E)** $\frac{15}{32}$



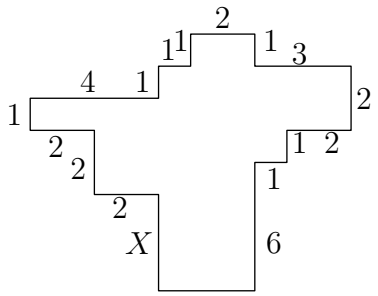
3. Isabella had a week to read a book for a school assignment. She read an average of 36 pages per day for the first three days and an average of 44 pages per day for the next three days. She then finished the book by reading 10 pages on the last day. How many pages were in the book?

(A) 240 **(B)** 250 **(C)** 260 **(D)** 270 **(E)** 280

4. Eight friends ate at a restaurant and agreed to share the bill equally. Because Judi forgot her money, each of her seven friends paid an extra \$2.50 to cover her portion of the total bill. What was the total bill?

(A) \$120 **(B)** \$128 **(C)** \$140 **(D)** \$144 **(E)** \$160

5. In the diagram, all angles are right angles and the lengths of the sides are given in centimeters. Note the diagram is not drawn to scale. What is X, in centimeters?



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

6. What is the value of $4 \cdot (-1 + 2 - 3 + 4 - 5 + 6 - 7 + \cdots + 1000)$?
(A) -10 **(B)** 0 **(C)** 1 **(D)** 500 **(E)** 2000

7. Using only pennies, nickels, dimes, and quarters, what is the smallest number of coins Freddie would need so he could pay any amount of money less than one dollar?
(A) 6 **(B)** 10 **(C)** 15 **(D)** 25 **(E)** 99

8. What is the value of
$$\frac{2^{2014} + 2^{2012}}{2^{2014} - 2^{2012}}?$$
(A) -1 **(B)** 1 **(C)** $\frac{5}{3}$ **(D)** 2013 **(E)** 2^{4024}

9. In 2005 Tycoon Tammy invested \$100 for two years. During the the first year her investment suffered a 15% loss, but during the second year the remaining investment showed a 20% gain. Over the two-year period, what was the change in Tammy's investment?
(A) $5\%loss$ **(B)** $2\%loss$ **(C)** $1\%gain$ **(D)** $2\%gain$ **(E)** $5\%gain$

10. For any positive integer n, define n to be the sum of the positive factors of n. For example, $6 = 1 + 2 + 3 + 6 = 12$. Find 11.
(A) 13 **(B)** 20 **(C)** 24 **(D)** 28 **(E)** 30

11. How many two-digit numbers have digits whose sum is a perfect square?
(A) 13 **(B)** 16 **(C)** 17 **(D)** 18 **(E)** 19

12. When a fair six-sided dice is tossed on a table top, the bottom face cannot be seen. What is the probability that the product of the 5 faces than can be seen is divisible by 6?

(A) 1/3 **(B)** 1/2 **(C)** 2/3 **(D)** 5/6 **(E)** 1

13. The lengths of the sides of a triangle in inches are three consecutive integers. The length of the shorter side is 30% of the perimeter. What is the length of the longest side?

(A) 7 **(B)** 8 **(C)** 9 **(D)** 10 **(E)** 11

14. Austin and Temple are 50 miles apart along Interstate 35. Bonnie drove from Austin to her daughter's house in Temple, averaging 60 miles per hour. Leaving the car with her daughter, Bonnie rod a bus back to Austin along the same route and averaged 40 miles per hour on the return trip. What was the average speed for the round trip, in miles per hour?

(A) 46 **(B)** 48 **(C)** 50 **(D)** 52 **(E)** 54

15. How many digits are in the product $4^5 \cdot 5^{10}$?

(A)8 **(B)**9 **(C)**10 **(D)**11 **(E)**12

16. Annie and Bonnie are running laps around a 400-meter oval track. They started together, but Annie has pulled ahead because she is 25% faster than Bonnie. How many laps will Annie have run when she first passes Bonnie?

(A) $1\frac{1}{4}$ **(B)** $3\frac{1}{3}$ **(C)** 4 **(D)** 5 **(E)** 25

17. A square with integer side length is cut into 10 squares, all of which have integer side length and at least 8 of which have area 1. What is the smallest possible value of the length of the side of the original square?

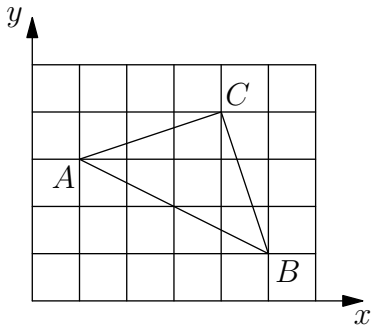
(A) 3 **(B)** 4 **(C)** 5 **(D)** 6 **(E)** 7

18. Four children were born at City Hospital yesterday. Assume each child is equally likely to be a boy or a girl. Which of the following outcomes is most likely? **(A)** *all* 4 *are boys*
(B) *all* 4 *are girls*
(C) 2 *are girls and* 2 *are boys*
(D) 3 *are of one gender and* 1 *is of the other gender*
(E) *all of these outcomes are equally likely*

19. A triangle with vertices as $A = (1, 3)$, $B = (5, 1)$, and $C = (4, 4)$ is plotted

on a 6×5 grid. What fraction of the grid is covered by the triangle?

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



20. A 1×2 rectangle is inscribed in a semicircle with longer side on the diameter. What is the area of the semicircle?

(A) $\frac{\pi}{2}$ **(B)** $\frac{2\pi}{3}$ **(C)** π **(D)** $\frac{4\pi}{3}$ **(E)** $\frac{5\pi}{3}$

21. The 7-digit numbers $\underline{7}\ \underline{4}\ \underline{A}\ \underline{5}\ \underline{2}\ \underline{B}\ \underline{1}$ and $\underline{3}\ \underline{2}\ \underline{6}\ \underline{A}\ \underline{B}\ \underline{4}\ \underline{C}$ are each multiples of 3. Which of the following could be the value of C?

(A) 1 **(B)** 2 **(C)** 3 **(D)** 5 **(E)** 8

22. Let R be a set of nine distinct integers. Six of the elements are 2, 3, 4, 6, 9, and 14. What is the number of possible values of the median of R ?

(A) 4 **(B)** 5 **(C)** 6 **(D)** 7 **(E)** 8

23. How many 4-digit positive integers have four different digits, where the leading digit is not zero, the integer is a multiple of 5, and 5 is the largest digit?

(A)24 **(B)**48 **(C)**60 **(D)**84 **(E)**108

24. What is the correct ordering of the three numbers, 10^8, 5^{12}, and 2^{24}?

(A) $2^{24} < 10^8 < 5^{12}$ **(B)** $2^{24} < 5^{12} < 10^8$ **(C)** $5^{12} < 2^{24} < 10^8$ **(D)** $10^8 < 5^{12} < 2^{24}$ **(E)** $10^8 < 2^{24} < 5^{12}$

25. For each positive integer $m > 1$, let $P(m)$ denote the greatest prime factor of m. For how many positive integers n is it true that both $P(n) = \sqrt{n}$ and $P(n + 48) = \sqrt{n + 48}$?

(A) 0 **(B)** 1 **(C)** 3 **(D)** 4 **(E)** 5