2001 MAA AMC Sample Questions

AMC 10

4. What is the maximum number for the possible points of intersection of a circle and a triangle?
   (A) 2 (B) 3 (C) 4 (D) 5 (E) 6

7. When the decimal point of a certain positive decimal number is moved four places to the right, the new number is four times the reciprocal of the original number. What is the original number?
   (A) 0.0002 (B) 0.002 (C) 0.02 (D) 0.2 (E) 2

10. If x, y, and z are positive with $xy = 24$, $xz = 48$, and $yz = 72$, then $x + y + z$ is
    (A) 18 (B) 19 (C) 20 (D) 22 (E) 24

12. Suppose that n is the product of three consecutive integers and that n is divisible by 7. Which of the following is not necessarily a divisor of n?
    (A) 6 (B) 14 (C) 21 (D) 28 (E) 42

20. A regular octagon is formed by cutting an isosceles right triangle from each of the corners of a square with sides of length 2000. What is the length of each side of the octagon?
    (A) $\frac{1}{3}(2000)$ (B) $2000(\sqrt{2}-1)$ (C) $2000(2-\sqrt{2})$ (D) 1000 (E) $1000\sqrt{2}$

AMC 12

1. The sum of two numbers is S. Suppose 3 is added to each number and then each of the resulting numbers is doubled. What is the sum of the final two numbers?
   (A) $2S + 3$ (B) $3S + 2$ (C) $3S + 6$ (D) $2S + 6$ (E) $2S + 12$

2. Let $P(n)$ and $S(n)$ denote the product and the sum, respectively, of the digits of the integer n. For example, $P(23) = 6$ and $S(23) = 5$. Suppose N is a two-digit number such that $N = P(N) + S(N)$. What is the units digit of N?
   (A) 2 (B) 3 (C) 6 (D) 8 (E) 9

9. Let f be a function satisfying $f(xy) = f(x)/y$ for all positive real numbers x and y. If $f(500) = 3$, what is the value of $f(600)$?
   (A) 1 (B) 2 (C) $\frac{5}{2}$ (D) 3 (E) $\frac{18}{5}$

14. Given the nine-sided regular polygon $A_1A_2A_3A_4A_5A_6A_7A_8A_9$, how many distinct equilateral triangles in the plane of the polygon have at least two vertices in the set $\{A_1,A_2,\ldots A_9\}$?
    (A) 30 (B) 36 (C) 63 (D) 66 (E) 72

15. An insect lives on the surface of a regular tetrahedron with edges of length 1. It wishes to travel on the surface of the tetrahedron from the midpoint of one edge to the midpoint of the *opposite* edge. What is the length of the shortest such trip? (Note: Two edges of a tetrahedron are opposite if they have no common endpoint.)
    (A) $\frac{1}{2}\sqrt{3}$ (B) 1 (C) $\sqrt{2}$ (D) $\frac{3}{2}$ (E) 2

Answers: AMC 10 4. (E) 7. (C) 10. (D) 12. (D) 20. (B) AMC 12 1. (E) 2. (E) 9. (C) 14. (D) 15. (B)