MATHEMATICS – TEST 1

Exactly one from the given answers (A)–(D) at each problem is always true. Mark right answers with crossing in this paper.

1. What is the smallest four-digit positive integer which has four different digits?
   (A) 1 032 (B) 1 021 (C) 1 234 (D) 1 023

2. In rectangle $ABCD$, the ratio of the angle $ADB$ to the angle $ABD$ is $1 : 5$. What is the size of the angle $BDC$?
   (A) $15^\circ$ (B) $18^\circ$ (C) $72^\circ$ (D) $75^\circ$

3. What is the integer $x$ so that $\frac{x}{5}$ lies between $\frac{71}{5}$ and $\frac{113}{11}$?
   (A) 89 (B) 91 (C) 92 (D) 95

4. If $|x - 2| = p$, where $x < 2$, then $x + 1$ equals
   (A) $-2$ (B) $3 - p$ (C) $|2p - 2|$ (D) $2p - 2$

5. A chord which is the perpendicular bisector of a radius of length 12 in a circle has length
   (A) 27 (B) $12\sqrt{3}$ (C) $6\sqrt{3}$ (D) $3\sqrt{3}$
6. The sum \(1 - 2 + 3 - 4 + 5 - \cdots - 2014 + 2015\) is equal

(A) 1008  (B) 1007  (C) 1  (D) -1007

7. We are given a triangle with sides of lengths 6, 8, 10. The radius of its circumcircle is

(A) 4  (B) 4.5  (C) 5  (D) 6

8. Let \(S = (x - 1)^3 + 3(x - 1)^2 + 3(x - 1) + 1\). Then \(S\) is equal

(A) \((x - 2)^3\)  (B) \((x - 1)^3\)  (C) \(x^3 - 1\)  (D) \(x^3\)

9. Let \(ABCDEF\) be a regular hexagon in the plane and \(ABGHJ\) be a regular pentagon lying in the opposite half-plane with respect to the line \(AB\) as the hexagon \(ABCDEF\). The measure of the angle \(FJA\) is

(A) 17.5°  (B) 22.5°  (C) 24°  (D) 30°

10. What is the smallest prime number dividing the sum \(3^{2014} + 7^{2015}\)

(A) 2  (B) 5  (C) 11  (D) \(3^{2014} + 7^{2015}\)
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Answers:

1. (D)
2. (D)
3. (C)
4. (B)
5. (B)
6. (A)
7. (C)
8. (D)
9. (C)
10. (A)