Number Theory I Exercise

- **วิชชาภัทร จินดานาถ** previously submitted answers to this quiz/test on 02-Nov-2023 @ 10:02:12 and obtained **14** correct answers out of **14** .
- This test/quiz can be taken many times.
- Correct answers will NOT be revealed after submission.

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1 **For question 1-6**

Let x and y be real numbers, and n be a nonnegative integer. Please answer whether it is **True or False**.

From previous attempt

$\lfloor x \rfloor = \lceil x \rceil$ if and only if x is an integer

True

False

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2 $\lceil x - n \rceil = \lceil x \rceil - n$

From previous attempt

True

False

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3 $x > n$ if and only if $\lceil x \rceil > n$

From previous attempt

True

False

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4 $x \leq n$ if and only if $\lfloor x \rfloor \leq n$

True

False

From previous attempt

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5 $\lfloor nx \rfloor \geq n \lfloor x \rfloor$

True

False

From previous attempt

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6 $\lceil xy \rceil \leq \lceil x \rceil \lceil y \rceil$

True

False

From previous attempt

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7 Find the largest integer x such that $\left\lfloor \frac{2x+7}{5} \right\rfloor = 11$

24

25

26

27

From previous attempt

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8 Find the smallest positive k such that $11 | 1000^2 + 1001^2 + 1002^2 + k$

3

5

7

9

From previous attempt

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9 How many possible integer n such that $n+3|4n^2+7n-5$

From previous attempt

4

5

10

8

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10 Find the greatest common divisor of $n!+1$ and $(n+1)!+1$

From previous attempt

1

n−1

n!−1

n!+1

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11 Let $p_1p_2...p_k = 1+q_1q_2...q_{100}$, where $q^i = 2^i - 1$ and i = 1,2,3, ... where p_j is prime number and $p_1 \leq p_2 \leq ... \leq p_k$.

Find p_1.

From previous attempt

2

3

5

7

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12 Find the largest positive integer d such that $d|n^2+1$ and $d|(n+1)^2+1$ for some integer n.

From previous attempt

1

5

7

11

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13 Let $[a_1, a_2, a_3, \ldots]$ is simple continued fraction of $\frac{1237}{125}$. Find $a_1 + a_2 + a_3 + \ldots$.

14 From previous attempt

17

20

24

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14 Find the smallest integer k such that $2^{2023} + 5^{2023} + 6^{2023} + 6^{2023} \equiv k (mod 7)$

3 From previous attempt

4

5

6

Submit

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