

Number Theory in Global Context

Number Theory · Answer Key · 12 Questions

1. The number of independent countries in the United Nations is a prime number. What is the sum of the digits of the next prime number greater than 193?

- A) 13
- B) 14**
- C) 15
- D) 16

2. The total number of time zones (including fractional offsets) is 38. What is the smallest prime factor of the number of years in a century multiplied by this number?

- A) 2**
- B) 3
- C) 5
- D) 7

3. The length of the Equator is approximately 40,075 kilometers. What is the largest prime factor of the integer part of this value divided by 5?

- A) 167
- B) 173
- C) 179**
- D) 181

4. The number of official languages of the United Nations is 6. How many distinct ways can you choose a committee of 3 languages from these 6, which is equivalent to the number of combinations 6C_3 ?

- A) 15
- B) 20**
- C) 25
- D) 30

5. The number of sovereign states in the world as recognized by the UN is 193. Which of the following is the primitive root modulo 193?

- A) 2
- B) 3
- C) 5**
- D) 7

6. The number of states in the United States of America is 50. How many divisors does 50 have?

- A) 4
- B) 5
- C) 6**
- D) 8

7. The highest peak in the world, Mount Everest, is 8,848 meters high. What is the sum of the prime factors of 8848?

- A) 13
- B) 17**
- C) 21
- D) 23

8. There are 7 continents on Earth. How many positive integers less than 7 are coprime to 7?

- A) 4
- B) 5
- C) 6**
- D) 7

9. The number of years in a decade is 10. What is the value of the totient function $\phi(10)$?

- A) 2
- B) 4**
- C) 5
- D) 6

10. The number of countries in the G20 is 19 (plus the EU). What is the smallest prime number greater than 19?

- A) 21
- B) 23**
- C) 25
- D) 29

11. The number of letters in the official long-form name of the United Kingdom (United Kingdom of Great Britain and Northern Ireland) is 47. Is 47 a Mersenne prime?

- A) Yes, $2^5 - 1$
- B) Yes, $2^6 - 1$
- C) No, it is a Sophie Germain prime**
- D) No, it is a composite number

12. The total number of countries in Africa is 54. What is the prime factorization of 54?

A) $2 \cdot 3^2$

B) $2 \cdot 3^3$

C) $3 \cdot 2^3$

D) $2^2 \cdot 3^2$