Class 6 Maths

Prime Numbers & Prime Factors

Mental Problems

1. Numbers that have only two factors are called _____.
2. Numbers that have more than two factors are called _____.
3. Number 1 is neither a _____ or a _____ number.
4. Number 1 is not a prime because it has only _____ factor.
5. _____ is the only even prime number.
6. _____ are pairs of primes having a difference of 2.
7. _____ numbers have no common factors other than 1.
8. A number written as the product of prime numbers is called _____.
9. The number ____ does not have any prime factorisation.
10. The prime factors may come in any order. True or False.
11. The smallest odd prime is _____.
12. The largest 2-digit prime number is _____.
13. Total number of even prime number is _____.
14. In prime factorisation of 180, number 3 appears _____ times.
15. In prime factorisation of a number, a prime factor may or may not repeat itself. True or False.
16. How many prime numbers are there between 1 and 100? _____
17. Which digits can never appear in the units place of the prime number.
18. The smallest 2-digit composite number is _____.
19. Two consecutive counting numbers are always co-prime. True or False.
20. Two prime numbers are always co-prime. True or False.

Solve all

1. Find the prime factors of 56.
2. Find the prime factors of 72.
3. Find the prime factorisation of 225 X 72 without multiplying.
4. Check if 56 and 63 are co-prime.
5. Use prime factorisation to check is 72 divisible by 12.

6. Write the prime numbers from 40 to 90.
7. Write all the pairs of twin-primes between 1 and 100.
8. Check if 231 is a composite number.
9. Is 252 a multiple of 33? (use prime factorization method)
10. The prime factorisations of 44100 is?
11. Find the smallest number whose prime factorisation has three different prime numbers.
12. The prime factorisation of the smallest 4-digit number.
13. Check whether 693 is divisible by 78. (use prime factorization method)
14. Find the prime factorisation of 81 X 25 without multiplying.
15. The first number has a prime factorisation 2 X 5 X 7 and the second number has prime factorisation 5 X 7 X 11. Are they co-prime? Does one of them divide the other?

Mental Problems – Answers

1. Numbers that have only two factors are called **prime numbers**
2. Numbers that have more than two factors are called **composite numbers**
3. Number 1 is neither a **prime** nor a **composite** number
4. Number 1 is not a prime because it has only **one** factor
5. **2** is the only even prime number
6. **Twin primes** are pairs of primes having a difference of **2** *(Example: 3 & 5, 11 & 13)*
7. **Co-prime** numbers have no common factors other than 1
8. A number written as the product of prime numbers is called **prime factorisation**
9. The number **1** does not have any prime factorisation
10. The prime factors may come in any order → **True**
11. The smallest odd prime is **3**
12. The largest 2-digit prime number is **97**
13. Total number of even prime number is **1** *(Only 2)*

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14. Prime factorisation of 180

180 = 2 × 2 × 3 × 3 × 5
→ Number 3 appears **2 times**

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15. In prime factorisation, a prime factor may or may not repeat → **True**
16. Number of prime numbers between 1 and 100 = **25**

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17. Digits that can never appear in the units place of a prime number

0, 4, 6, 8
(2 and 5 must be ignored as they are prime numbers)

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18. The smallest 2-digit composite number is 10

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19. Two consecutive counting numbers are always co-prime → True
(Example: 8 & 9 → no common factor except 1)

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20. Two prime numbers are always co-prime → True
(They only share 1 as common factor)

Solve All

1. Prime factors of 56

56 ÷ 2 = 28
28 ÷ 2 = 14
14 ÷ 2 = 7
7 ÷ 7 = 1

Answer: $56 = 2 \times 2 \times 2 \times 7 = 2^3 \times 7$

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2. Prime factors of 72

72 ÷ 2 = 36
36 ÷ 2 = 18
18 ÷ 2 = 9
9 ÷ 3 = 3
3 ÷ 3 = 1

Answer: $72 = 2^3 \times 3^2$

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3. Prime factorisation of 225 × 72 (without multiplying)

$225 = 3^2 \times 5^2$
$72 = 2^3 \times 3^2$

So,
$225 \times 72 = 2^3 \times 3^4 \times 5^2$

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4. Check if 56 and 63 are co-prime

$56 = 2^3 \times 7$
$63 = 3^2 \times 7$

Common factor = 7
Answer: Not co-prime

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5. Is 72 divisible by 12?

$72 = 2^3 \times 3^2$
$12 = 2^2 \times 3$

Since 72 contains all factors of 12 → **Yes, divisible**

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6. Prime numbers from 40 to 90

41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89

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7. Twin prime pairs (1 to 100)

(3,5), (5,7), (11,13), (17,19), (29,31), (41,43), (59,61), (71,73)

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8. Check if 231 is composite

$231 = 3 \times 77 = 3 \times 7 \times 11$

Answer: Composite number

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9. Is 252 a multiple of 33?

$252 = 2^2 \times 3^2 \times 7$
$33 = 3 \times 11$

11 is missing in 252

Answer: No

10. Prime factorisation of 44100

$44100 = 441 \times 100$
$441 = 21^2 = (3 \times 7)^2 = 3^2 \times 7^2$
$100 = 2^2 \times 5^2$

Answer: $44100 = 2^2 \times 3^2 \times 5^2 \times 7^2$

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11. Smallest number with 3 different prime factors

Smallest primes: 2, 3, 5

$2 \times 3 \times 5 = 30$

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12. Prime factorisation of smallest 4-digit number (1000)

$1000 = 10^3 = (2 \times 5)^3$

Answer: $1000 = 2^3 \times 5^3$

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13. Is 693 divisible by 78?

$693 = 3^2 \times 7 \times 11$
$78 = 2 \times 3 \times 13$

2 and 13 are missing

Answer: No

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14. Prime factorisation of 81 × 25 (without multiplying)

$81 = 3^4$
$25 = 5^2$

Answer: $3^4 \times 5^2$

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15. Given numbers

First = $2 \times 5 \times 7$
Second = $5 \times 7 \times 11$

Common factors = 5 and 7

Answer:

- **Not co-prime**
- **One does NOT divide the other (missing factors)**
