

Board –CBSE	Class – 6 th	Topic – Prime and Composite Numbers
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Example: As 15 and 39 have 3 as a common factor, they are not co-prime.
But 4 and 9 are co-prime.

Example: Consider 40 and 231. Their prime factorisations are as follows:

$$40 = 2 \times 2 \times 2 \times 5 \text{ and } 231 = 3 \times 7 \times 11$$

We see that there are no common primes that divide both 40 and 231. Indeed, the prime factors of 40 are 2 and 5 while, the prime factors of 231 are 3, 7, and 11. Therefore, 40 and 231 are co-prime!

Example: Consider 242 and 195. Their prime factorisations are as follows:

$$242 = 2 \times 11 \times 11 \text{ and } 195 = 3 \times 5 \times 13$$

The prime factors of 242 are 2 and 11. The prime factors of 195 are 3, 5, and 13. There are no common prime factors. Therefore, 242 and 195 are co-prime.

Q1. Which of the following numbers is the product of exactly three distinct prime numbers: 45, 60, 91, 105, 330?

Solution:

- $45 = 3 \times 3 \times 5$ (2 distinct primes)
- $60 = 2 \times 2 \times 3 \times 5$ (3 distinct primes)
- $91 = 7 \times 13$ (2 distinct primes)
- $105 = 3 \times 5 \times 7$ (3 distinct primes)
- $330 = 2 \times 3 \times 5 \times 11$ (4 distinct primes)
- Therefore, the numbers 60 and 105 are the products of exactly three distinct prime numbers.

Q.2 Classify the following numbers as prime, composite, or neither: 1, 2, 9, 17, 20.

1 → Neither prime nor composite (only one factor).

2 → Prime (factors: 1 and 2).

9 → Composite (factors: 1, 3, 9).

17 → Prime (factors: 1 and 17).

20 → Composite (factors: 1, 2, 4, 5, 10, 20).

Q.3 Twin primes are pairs of prime numbers with a difference of 2. Find some twin prime pairs less than 100.

Solution:

The twin primes less than 100 include:

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

Q.4 What are the smallest prime number and the smallest composite number?

Solution:

- The smallest prime number is 2 , as it is the smallest number with exactly two factors (1 and 2).
- The smallest composite number is 4 , as it is the smallest number with more than two factors (1,2 , and 4).