Prime Factorisation

A. Choose the Correct Answer:

1. Which of the following is the prime factorisation of 60?
   a) 2 × 2 × 3 × 5
   b) 2 × 3 × 10
   c) 5 × 5 × 2
   d) 6 × 10

2. Which of the following is not a prime number?
   a) 3
   b) 13
   c) 21
   d) 17

3. The prime factorisation of 36 is:
   a) 2 × 2 × 3 × 3
   b) 6 × 6
   c) 2 × 3 × 6
   d) 3 × 12

4. How many prime numbers are there between 1 and 20?
   a) 7
   b) 8
   c) 9
   d) 10

5. Which number has only two factors, 1 and itself?
   a) 4
   b) 6
   c) 7
   d) 9

B. Write the Missing Terms to Complete the Sentences:

1. The smallest prime number is _____.

2. The prime factorisation of 100 is _____.

3. _____ is neither prime nor composite.

4. The product of prime numbers used to express a number is called its _____.

5. The number 45 can be expressed as _____ in terms of prime factors.

C. Figure out the answers to these questions:

1. Write the prime factorisation of 72 using division method.

2. Make a factor tree to find the prime factors of 90.

3. Find the prime factorisation of 144 and write it in exponential form.

4. If the prime factorisation of a number is $2^3 \times 3^2$, what is the number?
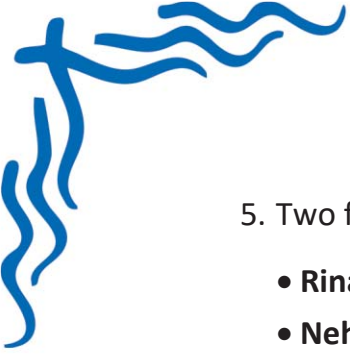
5. Two friends got the prime factors of 84 as:

- **Rina:** 2 × 2 × 3 × 7
- **Neha:** 3 × 2 × 7 × 2

Are both correct? Explain why.

6. Find the common prime factors of 60 and 90.

7. **Which number has this prime factorisation:** $2^2 \times 3 \times 5$? Also, write whether it is a perfect square or not.

8. A number has three prime factors: 2, 3, and 11. What could the number be? Give two possible numbers.

D. Mark each sentence with a True (✓) or False (✗):

1. Every number has a unique prime factorization.

2. The number 1 is considered a prime number.

3. 2 is the only even prime number.

4. Prime factorisation can include composite numbers.

5. The number 30 has more than three prime factors.

E. Challenge yourself with these questions:

1. A shopkeeper has 48 pencils and 60 erasers. He wants to pack them into boxes such that each box has equal number of pencils and erasers with no leftover. Use prime factorisation to find the greatest number of boxes he can make.

2. Factorise 250 using prime factorisation. Also, check whether it is divisible by 5 and 2.

3. Find the smallest number which is divisible by both 18 and 24 using prime factorisation.

4. A number has exactly two different prime factors. Write three such numbers.

5. Draw a factor tree for the number 180 and mention all the prime factors.

6. A number has a prime factorisation of $2^4 \times 5^2$. What is the number? How many total factors will it have?

7. Find the LCM and HCF of 42 and 70 using prime factorisation.

8. A boy thinks 33 is a prime number. Check using prime factorisation whether he is correct or not.