

Prime Factor Trees

Introduction to Prime Factor Trees

A prime factor tree is a diagram that helps break down a number into its prime factors. Prime factors are numbers that are only divisible by 1 and themselves, such as 2, 3, 5, 7, 11, etc. Using a tree structure, we can repeatedly divide a number by its factors until all branches end with prime numbers.

Worked Example

Let's find the prime factors of 60 using a factor tree.

Start by breaking 60 into two factors:

- $60 = 6 \times 10$

Now, break down 6 and 10 further:

- $6 = 2 \times 3$ (both are prime)
- $10 = 2 \times 5$ (both are prime)

So, the prime factors of 60 are 2, 2, 3, and 5.

Practice Questions

For each, list the prime factors at the end of your tree.

1. Draw a prime factor tree for 48.
2. Draw a prime factor tree for 84.
3. Draw a prime factor tree for 72.
4. Draw a prime factor tree for 90.
5. Draw a prime factor tree for 100.

Answer Key

1. **48:**

- Factor tree example: $48 \Rightarrow 6 \times 8$; $6 \Rightarrow 2 \times 3$; $8 \Rightarrow 2 \times 4$; $4 \Rightarrow 2 \times 2$
- Prime factors: 2, 2, 2, 2, 3

2. **84:**

- Factor tree example: $84 \Rightarrow 7 \times 12$; $12 \Rightarrow 3 \times 4$; $4 \Rightarrow 2 \times 2$
- Prime factors: 2, 2, 3, 7

3. **72:**

- Factor tree example: $72 \Rightarrow 8 \times 9$; $8 \Rightarrow 2 \times 4$; $4 \Rightarrow 2 \times 2$; $9 \Rightarrow 3 \times 3$
- Prime factors: 2, 2, 2, 3, 3

4. **90:**

- Factor tree example: $90 \Rightarrow 9 \times 10$; $9 \Rightarrow 3 \times 3$; $10 \Rightarrow 2 \times 5$
- Prime factors: 2, 3, 3, 5

5. **100:**

- Factor tree example: $100 \Rightarrow 10 \times 10$; each $10 \Rightarrow 2 \times 5$
- Prime factors: 2, 2, 5, 5