

Least Common Multiples

Method # 2: Finding LCMs using Factorizations

To find the LCM of a set of numbers (say 9 and 12):

1. Write the prime factorization of each number

$$9 = 3 \cdot 3 \qquad 12 = 2 \cdot 2 \cdot 3$$

2. Select one factorization and see if it contains the other(s).

If it does, it represents the LCM

If it does not, multiply that factorization by those prime factors of the other number(s) that it lacks. The final product is the LCM.

{ $2 \cdot 2 \cdot 3$ does NOT contain $3 \cdot 3$ }

{ $2 \cdot 2 \cdot 3 \cdot 3$ does NOT contain $3 \cdot 3$, so { $2 \cdot 2 \cdot 3 \cdot 3$ is the LCM }

Examples:

Find the LCM of {7, 21}

$$7 = 7 \qquad 21 = 3 \cdot 7$$

{ $3 \cdot 7$ contains the factorization of 7, so LCM is 21 }

Find the LCM of {8, 10}

$$8 = 2 \cdot 2 \cdot 2 \qquad 10 = 2 \cdot 5$$

{ $2 \cdot 2 \cdot 2$ does NOT contain $2 \cdot 5$ }

{ $2 \cdot 2 \cdot 2 \cdot 5$ does contain the factorization of 10 and is the LCM }

Find the LCM of {12, 18}