6.4 Least Common Multiple

The least common multiple (LCM) of two or more numbers is the least number (except 0) that is a common multiple of both (or all) of the numbers.

You can use a list or prime factorization to find the LCM.

Make a List

1. Write a list of multiples of each number.

2. Extend the list until you find a common multiple of the numbers.

Example: Find the LCM of 2 and 12.

Multiples of 2: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, ...

Multiples of 12: 12, 24, 36, 48, 60, ...

LCM: 12

Prime Factorization

1. Write the prime factorization for each number.

2. Write each prime factor the greatest number of times it appears in any of the numbers. Then multiply the factors.

Example: Find the LCM of 4 and 10.

4: 2 x 2

10: 2 x 5

2 x 2 x 5 = 20

Example: Find the LCM of the pair of numbers.

1.) 4 and 12

4: 4, 8, 12, 16, 20, 24, 28, ...

12: 12, 24, 36, 48, ...

LCM: 12

2.) 14 and 10

$2 \cdot 5 \cdot 7 = 70$ LCM

$2^1 \cdot 7^1$ $2^1 \cdot 5^1$

14: 2 · 7

10: 2 · 5

3.) 3 and 7

3: 3, 6, 9, 12, 15, 18, 21, 24, 27, ...

7: 7, 14, 21, ...

LCM = 21

4.) 2 and 5

LCM: 10

2: 2, 4, 6, 8, 10, 12, 14, 16, ...

5: 5, 10, ...

Example: Find the LCM of the set of numbers.

5.) 3, 9, and 12

3: 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36, ...

9: 9, 18, 27, 36, 45, 54, ...

12: 12, 24, 36

LCM: 36

6.) 4, 7, and 8

$2 \cdot 2 \cdot 2 \cdot 7 = 56$ LCM

$2^1 \cdot 2^1$ $2^2 \cdot 2^1$

4: 2 · 2

7: 7

8: 2 · 2 · 2

7.) 1, 6, and 7

6: 6, 12, 18, 24, 30, 36, 42, ...

7: 7, 14, 21, 28, 35, 42, ...

LCM: 42

8.) 1, 5, and 12

6^2

$2^1 \cdot 3^1$

5: 5

12: 2 · 2 · 3

LCM

$2 \cdot 2 \cdot 3 \cdot 5 = 60$