

Find the greatest common factor

$$\begin{array}{l} 26460 \rightarrow 2 \times 2 \times 3 \times 3 \times 3 \times 5 \times 7 \times 7 \\ 4200 \rightarrow 2 \times 2 \times 2 \times 3 \times 5 \times 5 \times 7 \\ \hline 2 \times 2 \times 3 \times 5 \times 7 \\ = 420 \end{array}$$

# What is the Least Common Multiple?

The least common multiple is the smallest multiple that is the same for two or more numbers.

## The Least Common Multiple

Determine the least common multiple of 18, 20, and 30  
using prime factorization

**Step #1** Write the prime factorization of each number.

**Step #2** Express each number as a product of powers.

**Step #3** Circle the greatest power of each prime number.

**Step #1** Write the prime factorization of each number.

$$18 = 2 \times 3 \times 3$$

$$20 = 2 \times 2 \times 5$$

$$30 = 2 \times 3 \times 5$$

**Step #2** Express each number as a product of powers.

$$18 \Rightarrow 2 \cdot 3 \cdot 3 = 2^1 \times 3^2$$

$$20 \Rightarrow 2 \cdot 2 \cdot 5 = 2^2 \times 5^1$$

$$30 \Rightarrow 2 \cdot 3 \cdot 5 = 2^1 \times 3^1 \times 5^1$$

**Step #3** Circle the greatest power of each prime number.

$$18 \Rightarrow 2 \cdot 3 \cdot 3 = 2^1 \cdot 3^2$$

$$20 \Rightarrow 2 \cdot 2 \cdot 5 = 2^2 \cdot 5^1$$

$$30 \Rightarrow 2 \cdot 3 \cdot 5 = 2^1 \cdot 3^1 \cdot 5^1$$

$$2^2 \times 3^2 \times 5^1$$
$$4 \times 9 \times 5$$

**Solution:**

$$2^2 \cdot 3^2 \cdot 5 = 4 \cdot 9 \cdot 5$$
$$= 180$$

**Determine the least common multiple of 120 & 309**

$$120 \rightarrow 2 \times 2 \times 2 \times 3 \times 5 = 2^3 \times 3^1 \times 5^1$$

$$309 \rightarrow 3 \times 103 = 3^1 \times 103^1$$

$$2^3 \times 3^1 \times 5^1 \times 103^1$$

$$8 \times 3 \times 5 \times 103$$

$$= 12360$$

**Determine the least common multiple of 70, 90 & 140**

$$\begin{aligned}70 &\rightarrow 2 \times 5 \times 7 = 2^1 \times 5^1 \times 7^1 \\90 &\rightarrow 2 \times 3 \times 3 \times 5 = 2^1 \times 3^2 \times 5^1 \\140 &\rightarrow 2 \times 2 \times 5 \times 7 = 2^2 \times 5^1 \times 7^1\end{aligned}$$

$$\begin{aligned}2^2 \times 3^2 \times 5^1 \times 7^1 \\4 \times 9 \times 5 \times 7 \\= 1260\end{aligned}$$





Questions:

- 7
- 8 d, e
- 9 c, d
- 10 e, f
- 11 c, d
- 13
- 17
- 19