

## Prime Factorization

You can think about prime factorization as a series of division problems.

Begin with the number you need to factor: 56

What is the least possible prime number that divides 56: 2.

Keep dividing by prime divisors until you get 1 as a quotient.

Divide 2 into 56.

1. Is the quotient 1? NO

$$\begin{array}{r} 28 \\ 2 \overline{)56} \end{array}$$

Repeat the process.

2. Is the quotient 1? NO

$$\begin{array}{r} 14 \\ 2 \overline{)28} \end{array}$$

Repeat the process.

3. Is the quotient 1? NO

$$\begin{array}{r} 7 \\ 2 \overline{)14} \end{array}$$

Repeat the process.

4. Is the quotient 1? YES

$$\begin{array}{r} 1 \\ 7 \overline{)7} \end{array}$$

STOP

Write the prime divisors as factors of 56.

$$56 = 2 \times 2 \times 2 \times 7$$

Use what you know about exponents to write the factors.

$$56 = 2^3 \times 7$$