A factor tree is one method of organizing and representing the prime factorization of a number. The following is another method of prime factorization.

$$\begin{array}{r|l} 2 & 140 \\ \hline 2 & 70 \\ \hline 5 & 35 \\ \hline & 7 \end{array}$$

Divide the original number by the smallest prime number and write the answer below the original number. Continue the pattern by dividing the next factor by the smallest prime number until all the values are prime themselves.

The prime factorization of $140 = 2 \times 2 \times 5 \times 7$.

Check Up

1. What is prime factorization of the number 147? Explain your reasoning.

☑ Compare your answers.

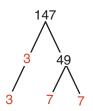1. What is prime factorization of the number 147? Explain your reasoning.

Since 147 is not divisible by 2, start by dividing it by the next smallest prime number, 3.

$147 \div 3 = 49$

But, 49 is not a prime number, so 49 must be further factored. The smallest prime factor of 49 is 7.

$49 \div 7 = 7$

The number 7 is a prime number, so 147 has been fully factored and can be written as follows:

$147 = 3 \times 7 \times 7$