

Prime factors: division method

Grade 6 Factoring Worksheet

Use the division method to break down each number into prime factors.
Write the prime factorization.

The **division method** is used to find prime factors by dividing a number by prime numbers until the result is 1.

Example:

$$\begin{array}{r|l} 5 & 30 \\ 3 & 6 \\ 2 & 2 \\ & 1 \end{array}$$

Factors:

2, 3, 5

Prime factorization:

$2 \times 3 \times 5$

1) $\begin{array}{r|l} & 45 \end{array}$

2) $\begin{array}{r|l} & 44 \end{array}$

3) $\begin{array}{r|l} & 86 \end{array}$

$45 = \underline{\hspace{2cm}}$

$44 = \underline{\hspace{2cm}}$

$86 = \underline{\hspace{2cm}}$

4) $\begin{array}{r|l} & 80 \end{array}$

5) $\begin{array}{r|l} & 105 \end{array}$

6) $\begin{array}{r|l} & 81 \end{array}$

$80 = \underline{\hspace{2cm}}$

$105 = \underline{\hspace{2cm}}$

$81 = \underline{\hspace{2cm}}$

7) $\begin{array}{r|l} & 121 \end{array}$

8) $\begin{array}{r|l} & 160 \end{array}$

9) $\begin{array}{r|l} & 125 \end{array}$

$121 = \underline{\hspace{2cm}}$

$160 = \underline{\hspace{2cm}}$

$125 = \underline{\hspace{2cm}}$

Answers

Note: You may divide by different prime numbers first, but the final prime factorization will always be the same.

$$\begin{array}{r|l} 5 & 45 \\ 3 & 9 \\ 3 & 3 \\ \hline & 1 \end{array}$$

$$45 = 3 \times 3 \times 5$$

$$\begin{array}{r|l} 2 & 44 \\ 2 & 22 \\ 11 & 11 \\ \hline & 1 \end{array}$$

$$44 = 2 \times 2 \times 11$$

$$\begin{array}{r|l} 2 & 86 \\ 43 & 43 \\ \hline & 1 \end{array}$$

$$86 = 2 \times 43$$

$$\begin{array}{r|l} 5 & 80 \\ 2 & 16 \\ 2 & 8 \\ 2 & 4 \\ 2 & 2 \\ \hline & 1 \end{array}$$

$$80 = 2 \times 2 \times 2 \times 2 \times 5$$

$$\begin{array}{r|l} 5 & 105 \\ 7 & 21 \\ 3 & 3 \\ \hline & 1 \end{array}$$

$$105 = 3 \times 5 \times 7$$

$$\begin{array}{r|l} 3 & 81 \\ 3 & 27 \\ 3 & 9 \\ 3 & 3 \\ \hline & 1 \end{array}$$

$$81 = 3 \times 3 \times 3 \times 3$$

$$\begin{array}{r|l} 11 & 121 \\ 11 & 11 \\ \hline & 1 \end{array}$$

$$121 = 11 \times 11$$

$$\begin{array}{r|l} 5 & 160 \\ 2 & 32 \\ 2 & 16 \\ 2 & 8 \\ 2 & 4 \\ 2 & 2 \\ \hline & 1 \end{array}$$

$$160 = 2 \times 2 \times 2 \times 2 \times 2 \times 5$$

$$\begin{array}{r|l} 5 & 125 \\ 5 & 25 \\ 5 & 5 \\ \hline & 1 \end{array}$$

$$125 = 5 \times 5 \times 5$$