

Fractions

Could you summarize the rules for multiplying and dividing fractions for me?

The following statements summarize the mechanical skills needed to multiply and divide fractions.

You cannot multiply or divide until the values you are working with look like common (or improper) fractions:

$$\frac{3}{4} \times \frac{1}{2} = ?$$
$$\frac{7}{8} \div \frac{3}{2} = ?$$

If they **do** look like common (or improper) fractions, use the following procedures.

When multiplying:

a) "top X top, bottom X bottom"

$$\frac{3}{4} \times \frac{1}{2} = \frac{3 \times 1}{4 \times 2} = \frac{3}{8}$$

When dividing:

b) "invert and multiply"

$$\frac{7}{8} \div \frac{3}{2} = \frac{7}{8} \times \frac{2}{3} = \frac{14}{24} = \frac{7}{12}$$

If they **do not** look like common (or improper) fractions, employ the following techniques.

Whole numbers can be converted to fractions by writing a denominator of 1 underneath.

$$\frac{9}{16} \times 3 = \frac{9}{16} \times \frac{3}{1} = \frac{27}{16} = 1 \frac{11}{16}$$
$$5 \div \frac{1}{3} = \frac{5}{1} \div \frac{1}{3} = \frac{5}{1} \times \frac{3}{1} = \frac{15}{1} = 15$$

Mixed numbers must be converted to improper fractions.

$$2 \frac{1}{2} \times \frac{5}{8} = \frac{5}{2} \times \frac{5}{8} = 1 \frac{9}{16}$$
$$6 \frac{1}{4} \div \frac{1}{3} = \frac{25}{4} \div \frac{1}{3} = \frac{25}{4} \times \frac{3}{1} = \frac{75}{4} = 18 \frac{3}{4}$$