

DIVIDING FRACTIONS NOTES

******You do not need common denominators to divide fractions**

DIVIDING A WHOLE NUMBER BY A FRACTION

Step 1: Write the whole number as a fraction with 1 as the denominator.

$$3 \div \frac{3}{5} = \frac{3}{1} \div \frac{3}{5}$$

Step 2: Write a multiplication problem by inverting* the second fraction.

***Note - invert means to reverse the placement of the numbers in the numerator & denominator. Example: $\frac{3}{5}$**

inverts to $\frac{5}{3}$ ALSO KNOWN AS RECIPROCAL - When you multiply a number by its RECIPROCAL the product is 1.

Example: $\frac{3}{5} \times \frac{5}{3} = \frac{15}{15} = 1$

$$\frac{3}{1} \div \frac{3}{5} \quad \longrightarrow \quad \frac{3}{1} \times \frac{5}{3} =$$

Step 3: Cross cancel if you can.

$$\begin{array}{c} 1 \\ \cancel{3} \quad 5 \\ \frac{1}{1} \times \frac{5}{\cancel{3}} \\ 1 \end{array}$$

Step 4: Multiply the numerators.
Multiply the denominators.

$$\frac{1}{1} \times \frac{5}{1} = \frac{5}{1}$$

Step 5: Write the answer in simplest form. $\longrightarrow \frac{5}{1} = 5$

DIVIDING A FRACTION BY A WHOLE NUMBER

Step 1: Write the whole number as a fraction with 1 as the denominator.

$$\frac{2}{5} \div 4 = \frac{2}{5} \div \frac{4}{1}$$

Step 2: Re-write as a multiplication problem by inverting the second fraction.

$$\frac{2}{5} \div \frac{4}{1} \longrightarrow \frac{2}{5} \times \frac{1}{4}$$

Step 3: Cross cancel if you can.

$$\begin{array}{c} 1 \\ \cancel{2} \times \frac{1}{\cancel{4}} \\ 5 \quad 2 \end{array}$$

Step 4: Multiply the numerators.
Multiply the denominators.

$$\frac{1}{5} \times \frac{1}{2} = \frac{1}{10}$$

Step 5: Write the answer in simplest form.

$$\frac{1}{10} = \frac{1}{10} \text{ (already in simplest form)}$$

DIVIDING A FRACTION BY A FRACTION

Step 1: Invert the divisor (the second fraction).

$$\frac{1}{2} \div \frac{5}{8} = \frac{1}{2} \div \frac{8}{5}$$

Step 2: Re-write as a multiplication problem by inverting the second fraction.

$$\frac{1}{2} \div \frac{5}{8} \longrightarrow \frac{1}{2} \times \frac{8}{5}$$

Step 3: Cross cancel if you can.

$$\begin{array}{c} 4 \\ \frac{1}{2} \times \frac{8}{5} \\ 1 \end{array}$$

Step 4: Multiply the numerators.
Multiply the denominators.

$$\frac{1}{1} \times \frac{4}{5} = \frac{4}{5}$$

Step 5: Write the answer in simplest form.

$$\frac{4}{5} = \frac{4}{5} \text{ (already in simplest form)}$$

DIVIDING MIXED NUMBERS

Step 1: Write each mixed number as an improper fraction.

$$6\frac{2}{3} \div 2\frac{1}{2} = \frac{20}{3} \div \frac{5}{2}$$

Step 2: Re-write as a multiplication problem by inverting the second fraction.

$$\frac{20}{3} \div \frac{5}{2} \longrightarrow \frac{20}{3} \times \frac{2}{5}$$

Step 3: Cross cancel if you can.

$$\begin{array}{c} 4 \\ \cancel{20} \times \frac{2}{\cancel{5}} \\ 3 \quad 1 \end{array}$$

Step 4: Multiply the numerators.
Multiply the denominators.

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

Step 5: Write the answer in simplest form.

$$\frac{8}{3} = 2\frac{2}{3}$$