

Review Topic 7: Fraction Multiplication and Division

Look at the following examples. Decide what the rule is for multiplying fractions.

Examples: $\frac{2}{3} \times \frac{1}{5} = \frac{2}{15}$, $\frac{3}{4} \times \frac{3}{4} = \frac{9}{16}$, $\frac{5}{8} \times 3 = \frac{5}{8} \times \frac{3}{1} = \frac{15}{8} = 1\frac{7}{8}$, $\frac{4}{5} \times \frac{3}{4} = \frac{12}{20} = \frac{3}{5}$

Rule: $\frac{a}{b} \times \frac{c}{d} = \frac{a \times c}{b \times d}$

Notice: Fraction numbers must be written as the ratio of two integers to be multiplied.

Thus to multiply $2\frac{1}{2} \times 1\frac{3}{4} \times 12$

1. First change the mixed numbers to improper fractions $\frac{5}{2} \times \frac{7}{4} \times \frac{12}{1}$
2. to get $\frac{420}{8}$
3. This can be simplified to $52\frac{1}{2}$.

One other step can save time. Canceling reduces the answer before you multiply the numbers.

$$\frac{15}{2} \times \frac{7}{4} \times \frac{12}{25} = \frac{\cancel{15}^3}{2} \times \frac{7}{\cancel{4}_2} \times \frac{\cancel{12}^3}{\cancel{25}_5} = \frac{3 \times 7 \times 7}{2 \times 1 \times 5} = \frac{147}{10} = 14\frac{7}{10}$$

Fraction Division

To divide fractions, invert the second fraction and multiply.

Rule: $\frac{a}{b} \div \frac{c}{d} = \frac{a}{b} \times \frac{d}{c} = \frac{a \times d}{b \times c}$

$\frac{2}{3} \div \frac{1}{2} = \frac{2}{3} \times \frac{2}{1} = \frac{4}{3} = 1\frac{1}{3}$.

Notice: DON'T cancel until after the divisor (second number) is inverted.

For word problems, be very careful which number to write first in the problem. The thing being split, cut apart, or sorted goes first.

$$3\frac{1}{3} \div 2\frac{1}{2} = \frac{10}{3} \div \frac{5}{2} = \frac{10}{3} \times \frac{2}{5} = \frac{2}{3} \times \frac{2}{1} = \frac{4}{3} = 1\frac{1}{3}$$

1. Change to improper
2. Invert and Multiply
3. Cancel
4. Multiply
5. Simplify

Practice:

a) $\frac{1}{5} \times \frac{2}{3} =$ $\frac{1}{5} \times \left(-\frac{2}{3}\right) =$ $-\frac{1}{5} \times \frac{2}{3} =$ $-\frac{1}{5} \times \left(-\frac{2}{3}\right) =$

b) $\frac{1}{5} \div \frac{2}{3} =$ $\frac{1}{5} \div \left(-\frac{2}{3}\right) =$ $-\frac{1}{5} \div \frac{2}{3} =$ $-\frac{1}{5} \div \left(-\frac{2}{3}\right) =$

c) $\left(\frac{2}{3}\right)^2 =$ $\left(-\frac{2}{3}\right)^2 =$ $\left(-\frac{2}{3}\right)^3 =$ $\left(-\frac{2}{3}\right)^4 =$

d) $5\frac{1}{4} \times \left(-\frac{3}{7}\right) \times 1\frac{3}{5} =$ $-5\frac{1}{4} \times \left(-\frac{3}{7}\right) \times \left(-1\frac{3}{5}\right) =$ $5\frac{1}{4} \times \left(-\frac{3}{7}\right) \times \left(-1\frac{3}{5}\right) =$

e) $4\frac{3}{8} \div 3\frac{3}{4} =$ $-4\frac{3}{8} \div 3\frac{3}{4} =$ $4\frac{3}{8} \div \left(-3\frac{3}{4}\right) =$ $-4\frac{3}{8} \div \left(-3\frac{3}{4}\right) =$

f) $5^3 =$ $(-3)^4 =$ $(-2)^7 =$ $(-8)^2 =$

g) Jack has $2\frac{3}{4}$ sacks of flour. If he uses $\frac{2}{3}$ of the flour, how much flour is left?

Tiffany splits $\frac{4}{5}$ pounds of nails into 4 piles. How many pounds in each pile?

h) $15\frac{1}{2}$ pounds of chocolate is put in $\frac{3}{4}$ pound boxes. How many full boxes are made? How much chocolate is left?

A cube (box with all sides the same length) is $3\frac{1}{2}$ inches on each side. What is the volume of the cube?
Hint: Multiply all three sides. $(3\frac{1}{2})^3$

Find the surface area of the cube above.
Hint: 6 times $(3\frac{1}{2})^2$

How many cubes can be made of a piece of metal $367\frac{1}{2}$ square inches?

How much metal is left over?

i) $5\frac{3}{4}$ purdinkles are split into buckets that hold $\frac{2}{3}$ of a purdinkle. How many buckets will we need? (You don't need to know what a purdinkle is.)

j) $2\frac{3}{4}$ yards of fabric are needed for each shirt. How many yards for 10 shirts?

How many shirts could be made from 30 yards?

k) Write a word problem that requires multiplication of fractions then subtraction to solve.