

Fractions and Arithmetic

Fractions and Arithmetic!

By the end of the lesson, you will be able to:

- ~ Add, Subtract, Multiply, & Divide Fractions
- ~ Add, Subtract, Multiply, & Divide Decimals

Fractions!

Multiply:

To multiply fractions, we just multiply straight across. Multiply Numerators (tops) and Denominators (bottoms). Change mixed fractions to improper fractions.

Examples:

$$\frac{1}{8} \times \frac{8}{9} = \frac{1}{9}$$

$$1\frac{2}{5} \times \frac{2}{3} = 5\frac{7}{3} = 6\frac{2}{3}$$
$$= \frac{14}{3}$$

Fractions!

Multiply:

$$a.) \frac{2}{3} \times \frac{1}{4} = \frac{1}{6}$$

$$\frac{2}{12} = \frac{1}{6}$$

$$b.) 20 \frac{1}{2} \times 3 =$$

$$c.) \frac{1}{3} \times 19 \frac{4}{11} =$$

$$d.) 9 \frac{5}{8} \times 5 =$$

Fractions!

Divide:

To divide fractions, we must do KFC. KFC stands for:

K- Keep 1st fraction as is.

F - Flip the 2nd fraction (reciprocal).

C - Change the divide to a multiply.

Before you start, make sure you have changed mixed fractions to improper fractions.

Examples:

$$\frac{8}{6} \div \frac{2}{1} = \frac{4}{3} \div \frac{2}{1}$$
$$\frac{2}{3} \cdot \frac{1}{2} = \frac{2}{3}$$

$$1\frac{1}{5} \div \frac{2}{5} = \frac{6}{5} \div \frac{2}{5}$$
$$\frac{6}{5} \cdot \frac{5}{2} = \frac{30}{10} = 3$$

Fractions!

Divide:

$$a.) \frac{2}{3} \div \frac{1}{2} =$$

$$b.) \frac{2}{9} \div \frac{3}{5} =$$

$$c.) \frac{1}{2} \div \frac{7}{11} =$$

$$d.) \frac{7}{11} \div \frac{3}{5} =$$

Fractions!

Add:

To add fractions, we **MUST** get a common denominator. Then, we add the numerators (top) together and keep the common denominator.

Examples:

$$\begin{array}{l} \cdot S \\ -S \end{array} \frac{5}{9} + \frac{-33}{153} = \frac{25}{45} + \frac{-9}{45}$$

$$= \boxed{\frac{16}{45}}$$

$$\frac{8}{6} + 1$$

Fractions!

Add:

$$a.) \frac{2}{8} + \frac{4}{5} =$$

$$b.) \frac{2}{7} + \frac{6}{8} =$$

$$c.) \frac{6}{8} + \frac{9}{12} =$$

$$d.) 2\frac{4}{7} + 19 =$$

$$\frac{3}{4} + \frac{3}{4} = \frac{6}{4} = \boxed{\frac{3}{2}}$$

Fractions!

Subtract:

To subtract fractions, we *MUST* get a common denominator. Then, we subtract the numerators (top) and keep the common denominator.

Examples:

$$\frac{1}{8} - \frac{8}{9}$$

$$\frac{-13}{2 \cdot 3} - \frac{8 \cdot 2}{3 \cdot 2} = \frac{-3}{6} - \frac{16}{6}$$

$$= \frac{-19}{6}$$

Fractions!

Subtract:

$$a.) \frac{6}{12} - \frac{4}{11} =$$

$$b.) \frac{7}{10} - \frac{1}{9} =$$

$$c.) 1\frac{3}{10} - 5 =$$

$$d.) \frac{2}{10} - \frac{4}{5} =$$

Fractions!

Multiply and Dividing with Negative Numbers:

Multiply

$$- \cdot - = +$$

$$- \cdot + = -$$

$$+ \cdot - = -$$

$$+ \cdot + = +$$

Divide

$$- \div - = +$$

$$- \div + = -$$

$$+ \div - = -$$

$$+ \div + = +$$

Rule: Same signs = Pos.

&

Different signs = Neg.

Fractions!

State whether the answer is positive or negative:

$$-\frac{1}{2} \cdot -\frac{3}{4} = +$$

$$-\frac{1}{2} \div -\frac{3}{4} = +$$

$$-\frac{3}{5} \cdot \frac{1}{3} = -$$

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

$$\frac{2}{3} \cdot -\frac{4}{5} = -$$

$$\frac{2}{3} \div -\frac{4}{5} = -$$

$$\frac{2}{5} \cdot \frac{1}{3} = +$$

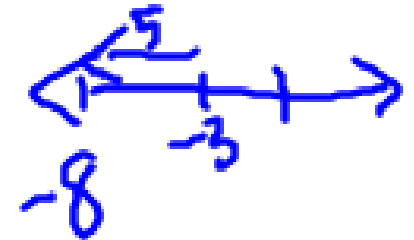
$$\frac{2}{5} \div \frac{1}{3} = +$$

Fractions!

Adding and Subtracting with Negative Numbers:

Adding: Same signs for both numbers means you keep that sign. Different sign means you keep the sign of the bigger number.

$$-3 + -5 = -8$$



$$3 + -5 = -2$$

Subtracting: When you subtract a negative, you end up adding (so go back to the adding rule).

Example: $-2 - -3 = -2 + 3 = 1$

Fractions!

State whether the answer is positive or negative:

$$-\frac{1}{2} + -\frac{3}{4} =$$

$$-\frac{1}{2} - -\frac{3}{4} =$$

$$-\frac{3}{5} + \frac{1}{3} =$$

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

$$\frac{2}{3} + -\frac{4}{5} =$$

$$\frac{2}{3} - -\frac{4}{5} =$$

$$\frac{2}{5} + \frac{1}{3} =$$

$$\frac{2}{5} - \frac{1}{3} =$$

Decimals!

Add: To add decimals, you need to line up the decimal points for all numbers vertically and then add.

When one number has more decimal places than another, use 0's to give them the same number of decimal places.

Example: $76.69 + 51.37$

1) Line up the decimal points:

$$\begin{array}{r} 76.69 \\ +51.37 \end{array}$$

2) Then add.

$$\begin{array}{r} 76.69 \\ +51.37 \\ \hline 128.06 \end{array}$$

Decimals!

Subtract: To subtract decimals, line up the decimal points and then follow the rules for adding or subtracting whole numbers, placing the decimal point in the same column as above.

When one number has more decimal places than another, use 0's to give them the same number of decimal places.

Example: $18.2 - 6.008$

1) Line up the decimal points.

$$\begin{array}{r} 18.2 \\ - 6.008 \end{array}$$

2) Add extra 0's, using the fact that $18.2 = 18.200$

$$\begin{array}{r} 18.200 \\ - 6.008 \\ \hline \end{array}$$

3) Subtract.

$$\begin{array}{r} 18.200 \\ - 6.008 \\ \hline 12.192 \end{array}$$

Decimals!

Multiply: Multiplying decimals is just like multiplying whole numbers. The only extra step is to decide how many digits to leave to the right of the decimal point. To do that, add the numbers of digits to the right of the decimal point in both factors.

Example: 4.032×4

$$\begin{array}{r} 4.032 \\ \times 4 \\ \hline 16.128 \end{array}$$

We can multiply 4032 by 4 to get 16128. There are three decimal places in 4.032, so place the decimal three digits from the right:

$$4.032 \times 4 = 16.128$$

Another Multiply Example:

$$\underline{6.74 \times 9.063}$$

5 decimal

We can multiply 674 by 9063 to get 6108462. Then there are 5 decimal places: two in the number 6.74 and three in the number 9.063, so place the decimal five digits from the right:

$$6.74 \times 9.063 = 61.08462.$$

Decimals!

Divide: To divide a decimal by a whole number, use long division, and just remember to line up the decimal points.

Example: $13.44 \div 12$

$$\begin{array}{r} 112 \\ 12 \overline{)13.44} \\ \underline{-12} \\ 14 \\ \underline{-12} \\ 24 \\ \underline{-24} \\ 0 \end{array}$$

$$\begin{array}{r} 1.12 \\ 12 \overline{)13.44} \\ \underline{-12} \\ 14 \\ \underline{-12} \\ 24 \\ \underline{-24} \\ 0 \end{array}$$

Decimals!

Divide: To divide a decimal by a decimal, **MOVE** the decimal point the same number of spots in both numbers to get a whole number for the divisor. Then the problem becomes one involving division by a whole number instead of division by a decimal.

Example:

$$0.144 \div 0.12$$

$$0.12 \overline{)0.144} = 12 \overline{)14.4}$$

Fractions and Arithmetic!

Let's try some examples together.

a.) $\left(\frac{25}{15}\right) \left(\frac{3}{10}\right)$

b.) $\underbrace{\left(3\frac{1}{3}\right) \left(\frac{1}{4}\right)} \left(1\frac{1}{5}\right)$

c.) $\underbrace{-47 + 22}_{-25} - 13$
 $= \boxed{-38}$

d.) $12(-23)$

Fractions and Arithmetic!

Let's try some examples together.

e.) $8.77 + 0.3 + 52.9$ f.) $4\frac{2}{5} \div \left(\frac{-9}{15}\right)$

g.) $(-1)(24)(-24)$

h.) $58 - (-21)$

Fractions and Arithmetic!

Let's try some examples together.

i.) $\frac{3}{5} - (-3\frac{1}{4})$

j.) $-1200 \div (-24)$

k.) $57.6 \div (-12)$

Fractions and Arithmetic!

By the end of the lesson, you will be able to:

- ~ Add, Subtract, Multiply, & Divide Fractions
- ~ Add, Subtract, Multiply, & Divide Decimals

CAN YOU?

Homework:

Journal: Journal 1

Assign: Assignment 1