

# Math, you can do it!

## Decimals, multiply / divide

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Since decimals are fractions, we are going to use the same reasoning and methodology to multiply and divide decimals as we did with fractions.

Remember, the basic strategy to multiply fractions was to multiply numerators, then multiply denominators. We will do the same with decimals.

With decimals, when you multiply the numbers, you are multiplying the numerators. By counting the digits to the right of the decimal points in the multiplicand and multiplier, that was a shortcut for multiplying the denominators. When you counted the number of digits from right to left in your answer, you found the new denominator.

Let's look at the following algorithm.

### MULTIPLICATION DECIMALS

1. Multiply the numbers normally
2. Count the number of digits to the right of the decimal points in the multiplicand and multiplier
3. Count that same number of places from right to left in your product to place the decimal point.

### EXAMPLE

$$5.32 \times 1.6$$

Rewriting the problem vertically, we have

$$\begin{array}{r} 5.32 \quad (100) \\ \times 1.6 \quad (10) \\ \hline 3192 \\ 532 \\ \hline 8512 \end{array}$$

By multiplying the denominators, 100 by 10, we can see the new denominator should be 1000. That means we have to have three digits to the right of the decimal point. Therefore the answer is

$$8.512$$

If you can do regular division, then dividing with decimals is a piece of cake.

Let's look at the division algorithm.

### DIVISION DECIMALS

1. Divide normally
2. Move the decimal point in the divisor as far to the right as possible
3. Move the decimal point the same number of places to the right in the dividend
4. Bring the decimal point straight up into the quotient

### EXAMPLE

$$.5 \overline{) 28.32}$$

By moving the decimal point as far to the right as possible in the divisor (number on the outside), then moving it the same number of places in the dividend, I essentially multiplied by ONE. Moving the decimal point one place is the same as multiplying by 10.

$$\begin{array}{r} 28.32 \\ \times 10 \\ \hline 283.2 \end{array} \quad \begin{array}{r} 10 \\ \times 10 \\ \hline 100 \end{array}$$

In other words, I made equivalent fractions. So, now I write the problem in the equivalent form and divide.

$$\begin{array}{r} 56.64 \\ \hline 5.) 283.20 \\ \underline{25} \phantom{00} \\ 33 \phantom{00} \\ \underline{30} \phantom{00} \\ 32 \phantom{00} \\ \underline{30} \phantom{00} \\ 20 \end{array}$$

You would have to receive some directions to determine how many places you want in the quotient.