Divide Decimals by Decimals

1. Solve, thinking carefully about how many times the divisor "fits into" the dividend. Compare the problems within the same "box."

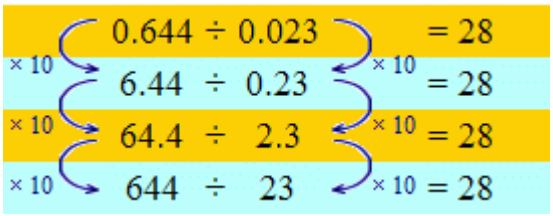
a. 60 ÷ 20 =	**e.** 350 ÷ 7 =
b. 6 ÷ 2 =	**f.** 35 ÷ 0.7 =
c. 0.6 ÷ 0.2 =	**g.** 3.5 ÷ 0.07 =
d. 0.06 ÷ 0.02 =	**h.** 0.35 ÷ 0.007 =

The above problems illustrate a way to solve decimal division problems. You noticed that in each case, the quotients (answers) were the same! And it is no wonder. Think of it as, "How many times does the divisor fit into the dividend?" 0.02 fits into the 0.06 as many times as 2 fits into 6. Or, 0.007 fits into 0.35 as many times as 7 fits into 350.

If we have a more difficult decimal division problem, such as 3.439 ÷ 5.6, we can *transform* it into a problem *with the same answer*, but with a whole-number *divisor*, which can be solved with long division.

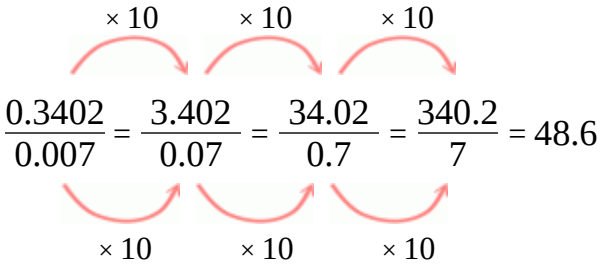
Look at the problems in #1 again, this time moving from the bottom up. In each step, the dividend increases by a factor of 10 (that is, it is multiplied by 10), and so does the divisor! When *both* the dividend and the divisor are increased by the *same* factor, the quotient remains the same!

The table on the right illustrates this idea again. Each line is one division problem. Each problem has the same answer, 28. Each problem's divisors differ from each other by a factor of 10, and so do each problem's dividends.



This idea is VERY important! Let's write some problems using the division line instead of the ÷ symbol. We can write the equal sign "=" between the problems because they all have the same answer.

The last step, $\frac{340.2}{7}$, can be done with long division, and the answer is 48.6.



If you still doubt that they're all the same, then check each of the division problems on the right with a calculator.

2. Continue the patterns, multiplying the dividend and divisor in each step by 10, so that the *quotients* (answers) remain the same.

a. 0.1 ÷ 0.02 =	**b.** 0.056 ÷ 0.008 =	**c.** 0.84 ÷ 0.04 =
1 ÷ _____ =	_____ ÷ _____ =	_____ ÷ _____ =
10 ÷ _____ =	_____ ÷ _____ =	_____ ÷ _____ =
100 ÷ _____ =	_____ ÷ _____ =	_____ ÷ _____ =