

SOL 5.5a Finding the sum, difference, product, and quotient of two numbers expressed as decimals through the thousandths place.

What you need to know: How to add, subtract, multiply, and divide decimal numbers through the thousandths place.

Key Vocabulary:

- 1) **Estimate**- when you round to the greatest place, then complete the mathematical operation.
- 2) **Divisor**- The smaller number being divided into the bigger number
- 3) **Dividend**- The bigger number, which is being divided into by the divisor
- 4) **Quotient**- Answer to a division problem
- 5) **Difference**- Answer to a subtraction problem
- 6) **Product**- Answer to a multiplication problem
- 7) **Sum**- Answer to an addition problem
- 8) **Factors**- The numbers being multiplied

How to do it: (adding decimal numbers)

Step 1: Line up the numbers you are adding, over each other, at the decimal point.

Step 2: Add the numbers

Step 3: Bring the decimal point straight down, and place it in your final answer.

Examples of adding decimal numbers: $3.45 + 5.785 =$

Step 1: 3.45
 $+ \underline{5.785}$ becomes $\begin{array}{r} 1 \\ 3.450 \\ + \underline{5.785} \\ 9.235 \end{array}$ You can add one or more zeroes to the right of the numbers if necessary.

More examples of adding decimal numbers: $19.6 + 4.672 =$

Step 1: 19.6
 $+ \underline{4.672}$ becomes $\begin{array}{r} 1 \\ 19.600 \\ + \underline{4.672} \\ 24.272 \end{array}$ Notice how zeroes were added here to hold the place value.

$5 + 3.97 =$

Step 1: 5
 $+ \underline{3.97}$ becomes $\begin{array}{r} 5.00 \\ + \underline{3.97} \end{array}$ Note how the whole number 5 can be written as 5.00.

Estimating: If you were asked to estimate, you would round each number to its greatest place, and then add.

$$\begin{array}{r} 47.507 \\ + \underline{8.69} \end{array} \quad \text{becomes} \quad \begin{array}{r} 50.000 \\ + \underline{9.000} \\ \hline 41.000 \end{array}$$

SOL 5.5a How to do it: (Subtracting decimal numbers)

Step 1: Line up the numbers you are subtracting, over each other. Please make sure the decimal point is lined up. Place a zero to the right of any decimal numbers if there are empty place value holders.

Step 2: Subtract, regrouping if necessary.

Step 3: Bring the decimal point straight down in your final answer.

Examples of subtracting decimal numbers.

Example 1)

$$49.276 - 8.56 = \begin{array}{r} 49.276 \\ - \underline{8.560} \\ \hline 40.716 \end{array} \quad \begin{array}{l} \text{Notice how a zero was} \\ \text{added to the bottom} \\ \text{number.} \end{array}$$

$$\text{Example 2) } 7 - 2.43 = \begin{array}{r} 7.00 \\ - \underline{2.43} \\ \hline 4.57 \end{array} \quad \begin{array}{l} \text{Notice how zeroes were added to the} \\ \text{top number. A decimal point was} \\ \text{also added behind the number 7.} \end{array}$$

Estimating: If you were asked to estimate, you would round each number to its greatest place, and then subtract.

$$\begin{array}{r} 37.27 \\ - \underline{6.518} \end{array} \quad \text{becomes} \quad \begin{array}{r} 40.000 \\ - \underline{7.000} \\ \hline 33.000 \end{array}$$

SOL 5.5a How to do it: (Multiplying decimal numbers)

Step 1: Line up the numbers you are multiplying, over each other-you do NOT need to line up the decimals!

Step 2: Multiply the numbers, carrying when necessary.

Step 3: Remember to use a “magic” zero when multiplying the second number. Be careful to line up your columns.

Step 4: Add the two columns you created when multiplying!

Step 5: Count the number of places to the right of the decimal point in each factor. Then starting on the right hand side of the answer, move over that number of places.

Examples of multiplying decimal numbers.

Example 1)

$$\begin{array}{r} 4.8 \\ \times .87 \\ \hline 336 \\ + 3840 \\ \hline 4.176 \end{array}$$

Notice how there were three numbers behind the decimal point in this problem. In the answer I started on the right and counted over three spaces to the left.

Example 2)

$$\begin{array}{r} 86.4 \\ \times 3.9 \\ \hline 7776 \\ 25920 \\ \hline 336.96 \end{array}$$

Notice how there were two numbers behind the decimal point in this problem. In the answer I started on the right and counted over three spaces to the left.

Estimating: 4.8 becomes 5.0 When estimating round both numbers to the greatest place, then multiply

$$\begin{array}{r} \times \underline{8.7} \\ \hline 00 \\ 4500 \\ \hline 45.00 \text{ or } 45 \end{array}$$

SOL 5.5a How to do it: (Dividing decimal numbers)

4) Dividing decimal numbers:

Step 1: First, division problems can be presented in two ways. Remember, the smaller number (divisor) is being divided into the bigger number (dividend).

$8.36 \div 4 =$ can be written as $4 \overline{)8.36}$ or $\frac{8.36}{4}$

Step 2: Use these steps when dividing. I like to remember the phrase:

D oes	D ivide
M cDonald's	M ultiply
S erve	S ubtract
C heese	C heck
B urgers	B ring down

Step 3: Remember to carefully line up your columns when dividing. Mistakes are usually made in division when columns are not lined up correctly, or from using incorrect multiplication facts.

Step 4: Finally, at the end simply bring the decimal point straight up. There are no remainders in decimal division, and you only use single digit divisors in fifth grade division

Examples of dividing decimal numbers.

$$\begin{array}{r} \underline{2.09} \\ 4 \overline{)8.36} \\ - 8 \\ \hline 3 \\ - 0 \\ \hline 36 \\ - 36 \\ \hline 0 \end{array}$$

$$\begin{array}{r} \underline{06.41} \\ 6 \overline{)38.46} \\ - 0 \\ \hline 38 \\ - 36 \\ \hline 24 \\ - 24 \\ \hline 06 \\ - 6 \\ \hline 0 \end{array}$$

$$\begin{array}{r} \underline{069.3} \\ 5 \overline{)346.5} \\ - 0 \\ \hline 34 \\ - 30 \\ \hline 46 \\ - 45 \\ \hline 15 \\ - 15 \\ \hline 0 \end{array}$$

Estimating: If you are asked to estimate when dividing, leave your single digit divisor as it is. If the divisor is smaller than the first digit of the dividend pick the closest single digit of the dividend and round to the greatest place. If the divisor is bigger than the dividend pick the nearest first two digits of the dividend that the divisor will go into, and round the rest.

$$7 \overline{)46.63}$$

In this case you are looking for the closest two digit number that 7 can go into. $7 \times 7 = 49$

$$7 \overline{)49.00}$$

Here the dividend is being changed to 49.0

$$\begin{array}{r} \underline{7.0} \\ 7 \overline{)49.0} \\ - 490 \\ \hline 0 \end{array}$$

After you pick the closest two digit number, simply divide. In this example 7.0 would be the estimate.

Let's take a look at estimating another problem:

$$3 \overline{)557.3}$$

In this case we are looking at what number is the most close to five that three would go into.

$$3 \overline{)557.3}$$

Next, you are trying to find the closest number in the hundreds place that 3 will go into. It is 6, so 557.3 becomes 600.0

$$\begin{array}{r} \underline{200.0} \\ 3 \overline{)600.0} \end{array}$$

Finally, you simply divide 3 into 600.0!

Your answer would be 200.0 or 200