

Grade 8 Long Division With Decimals

Name: _____

As we build on the process of Long Division (D M S B), it does not change for more complicated numbers. When we introduce decimals, there is no need to be scared or mathematically intimidated. There is an easy fix. First, you should know what each number is called. Remember that the answer is called the 'QUOTIENT' – the other two numbers each have a name – one is the dividend (the one that is being divided) and the other is the divisor (the one doing the dividing).

Example:

$$\begin{array}{ccc} 3136 \div 0.4 & & \frac{3136}{0.4} = \frac{31360}{4} \\ \text{(Dividend)} & \text{(Divisor)} & \end{array}$$

Re-write the question:

$$\begin{array}{r} 0.4 \overline{) 3136} \\ \text{(Divisor)} \quad \text{(Dividend)} \end{array}$$

$$\begin{array}{r} 4 \overline{) 31360} \end{array}$$

So, the way we make this simpler is to shift the decimal in the divisor to the right by one decimal place. This is essentially multiplying it by 10. In order for that to not affect the answer, you MUST shift the decimal on the dividend – essentially multiplying that by 10 also. Since both are multiplied by 10, the answer will not change – it is an equivalent number.

By shifting the decimal in the divisor, we eliminate the confusion of the decimal and the answer is easier to find.

$$\begin{array}{r} 3136 \div 0.8 \rightarrow 0.8 \overline{) 31360} \\ \phantom{0.8 \overline{) 31360}} \underline{3795} \\ \phantom{0.8 \overline{) 31360}} 8 \overline{) 31360} \\ \phantom{0.8 \overline{) 31360}} \underline{240} \\ \phantom{0.8 \overline{) 31360}} 63 \\ \phantom{0.8 \overline{) 31360}} \underline{56} \\ \phantom{0.8 \overline{) 31360}} 76 \\ \phantom{0.8 \overline{) 31360}} \underline{72} \\ \phantom{0.8 \overline{) 31360}} 40 \end{array}$$

Answer is 3795

$$\begin{array}{r} 316 \div 0.02 \rightarrow 0.02 \overline{) 316} \\ \phantom{0.02 \overline{) 316}} \underline{15800} \\ \phantom{0.02 \overline{) 316}} 2 \overline{) 31600} \\ \phantom{0.02 \overline{) 316}} \underline{20} \\ \phantom{0.02 \overline{) 316}} 11 \\ \phantom{0.02 \overline{) 316}} \underline{10} \\ \phantom{0.02 \overline{) 316}} 16 \\ \phantom{0.02 \overline{) 316}} \underline{16} \\ \phantom{0.02 \overline{) 316}} 00 \\ \phantom{0.02 \overline{) 316}} \underline{00} \\ \phantom{0.02 \overline{) 316}} 00 \\ \phantom{0.02 \overline{) 316}} \underline{00} \\ \phantom{0.02 \overline{) 316}} 00 \end{array}$$

Answer 15800

Try these too

$$3135 \div 0.05 \rightarrow 0.05 \overline{) 3135}$$

$$\Rightarrow 5 \overline{) 313500}$$

$$\begin{array}{r} 30 \downarrow \\ 13 \downarrow \\ 10 \downarrow \\ 35 \downarrow \\ 35 \downarrow \\ 00 \\ 00 \\ 00 \\ 00 \end{array}$$

$$5492 \div 0.5 \rightarrow 0.5 \overline{) 5492}$$

$$\Rightarrow 5 \overline{) 54920}$$

$$\begin{array}{r} 10984 \\ 5 \downarrow \\ 04 \downarrow \\ 0 \downarrow \\ 49 \downarrow \\ 45 \downarrow \\ 42 \downarrow \\ 40 \downarrow \\ 20 \end{array}$$

Now, what happens when the decimal is in the Dividend like in the following:

$$7 \overline{) 996.8}$$

In this case, you are to do nothing but pop the decimal up into the area for the quotient and then proceed as usual – D M S B.

$$\begin{array}{r} 142.4 \\ 7 \overline{) 996.8} \\ 7 \\ \hline 29 \\ 28 \\ \hline 16 \\ 14 \\ \hline 28 \\ 28 \\ \hline 0 \end{array}$$

So, the answer (quotient) is 142.4.

So, to make decimals easier, if the decimal is in the divisor, shift the decimal to get a whole number and then do the same with the dividend (both numbers). Do that first. If the decimal is in the dividend, or ends up in the dividend, just pop it up into the quotient or answer line. – Don't sweat the decimals in division.

Grade 8 Long Division With Decimals Practice

$$0.5 \overline{) 1942} \rightarrow 5 \overline{) 19420}$$

Handwritten solution for $0.5 \overline{) 1942}$ showing the conversion to $5 \overline{) 19420}$. The quotient is 3884.

$$0.4 \overline{) 1355} \rightarrow 4 \overline{) 13550.0}$$

Handwritten solution for $0.4 \overline{) 1355}$ showing the conversion to $4 \overline{) 13550.0}$. The quotient is 3387.5.

$$0.3 \overline{) 9618} \rightarrow 3 \overline{) 96180}$$

Handwritten solution for $0.3 \overline{) 9618}$ showing the conversion to $3 \overline{) 96180}$. The quotient is 32060.

$$1.1 \overline{) 891.66} \rightarrow 11 \overline{) 8916.6}$$

Handwritten solution for $1.1 \overline{) 891.66}$ showing the conversion to $11 \overline{) 8916.6}$. The quotient is 810.6.

$$1.2 \overline{) 4272} \rightarrow 12 \overline{) 42720}$$

Handwritten solution for $1.2 \overline{) 4272}$ showing the conversion to $12 \overline{) 42720}$. The quotient is 3560.

$$1.6 \overline{) 998.4} \rightarrow 16 \overline{) 9984}$$

Handwritten solution for $1.6 \overline{) 998.4}$ showing the conversion to $16 \overline{) 9984}$. The quotient is 624.

$$0.01 \overline{) 37.43} \rightarrow 1 \overline{) 3743}$$

$$\begin{array}{r} 3743 \\ 3 \downarrow \\ \hline 07 \\ 7 \downarrow \\ \hline 04 \\ 4 \downarrow \\ \hline 03 \end{array}$$

$$0.6 \overline{) 350.2} \rightarrow 6 \overline{) 3502.00}$$

$$\begin{array}{r} 583.66 \\ 30 \downarrow \\ \hline 50 \\ 48 \downarrow \\ \hline 22 \\ 18 \downarrow \\ \hline 40 \\ 36 \downarrow \\ \hline 40 \end{array}$$

$$0.4 \overline{) 588.5} \rightarrow 4 \overline{) 5885.00}$$

$$\begin{array}{r} 1471.25 \\ 4 \downarrow \\ \hline 18 \\ 16 \downarrow \\ \hline 28 \\ 28 \downarrow \\ \hline 05 \\ 4 \downarrow \\ \hline 10 \\ 8 \downarrow \\ \hline 20 \\ 20 \downarrow \\ \hline 0 \end{array}$$

$$0.2 \overline{) 628.3} \rightarrow 2 \overline{) 6283.0}$$

$$\begin{array}{r} 3141.5 \\ 6 \downarrow \\ \hline 02 \\ 2 \downarrow \\ \hline 08 \\ 8 \downarrow \\ \hline 03 \\ 2 \downarrow \\ \hline 10 \\ 10 \downarrow \\ \hline 0 \end{array}$$

$$0.3 \overline{) 13.82} \rightarrow 3 \overline{) 138.20}$$

$$\begin{array}{r} 46.06 \\ 12 \downarrow \\ \hline 18 \\ 18 \downarrow \\ \hline 02 \\ 0 \downarrow \\ \hline 20 \\ 18 \downarrow \\ \hline 2 \end{array}$$

$$0.2 \overline{) 863.1} \rightarrow 2 \overline{) 8631.0}$$

$$\begin{array}{r} 4315.5 \\ 8 \downarrow \\ \hline 06 \\ 6 \downarrow \\ \hline 03 \\ 2 \downarrow \\ \hline 11 \\ 10 \downarrow \\ \hline 10 \\ 10 \downarrow \\ \hline 0 \end{array}$$