

Decimals

$$\begin{array}{r}
 \begin{array}{l}
 4\ 3 \\
 6\ 4 \\
 6\ 4 \\
 \hline
 38.6 \\
 5.78 \\
 \hline
 3088 \\
 + 2702 \\
 \hline
 1930 \\
 \hline
 223108
 \end{array}
 \end{array}$$

To perform the long multiplication of the decimals, we do the multiplication procedure as we would do with natural numbers, regardless the position of decimal points, then the decimal point should be placed on the resulting line as many steps from the right side as the *sum of decimal digits of both numbers*. When we did the multiplication, we didn't take into the consideration the fact, that we are working with decimals, it is equivalent to the multiplication of each number by 10 or 100 or 1000 ... (depends of how many decimal digits it has). So, the result we got is greater by $10 \cdot 100 = 1000$ (in our example) time than the one we are looking for:

$$38.6 \cdot 5.78 = 38.6 \cdot 10 \cdot 5.78 \cdot 100 : (10 \cdot 100) = 386 \cdot 578 : 1000$$

Division.

1. One natural number is divided by another natural number.

We do the long division as we usually do. If the number is not divisible by the divisor, when the whole part is done, the decimal point is marked in the dividend and the quotient, and dividend is continued with 0. Division process is continue until there is no remainders.

2. Number is divided by a number with decimal part.

Both, dividend and divisor are multiplied by 10, 100, 1000 ..., depends on the number of digits after decimal point.

$$12 : 2.5 = 120 : 25; \quad 13.545 : 14.31 = (13.545 \cdot 100) : (14.31 \cdot 100) = 1354.5 : 1431$$

$$\begin{array}{r}
 41 \\
 3 \overline{)123} \\
 \underline{-12} \\
 03 \\
 \underline{-03} \\
 0
 \end{array}$$

$$\begin{array}{r}
 41 \\
 3 \overline{)123} \\
 \underline{-12} \\
 03 \\
 \underline{-03} \\
 0
 \end{array}$$

$$\begin{array}{r}
 0.41 \\
 3 \overline{)123} \\
 \underline{-12} \\
 03 \\
 \underline{-03} \\
 0
 \end{array}$$

Exercises:

1. a. $23.45 \cdot 12$; b. $123.1 \cdot 2.3$; c. $0.23 \cdot 0.87$;

2. a. $62.73 : 5.1$; b. $6.913 : 3.1$; c. $0.12 : 0.1$;

4. a. $102.093 - (47.123 + 5.68 + 31.7)$ b. $55.28 + 76.438 - (8.6 + 0.738)$

5. Do the mental math

$0.3 \cdot 6$; $8 \cdot 0.5$; $0.1 \cdot 7$; $0.75 \cdot 10$; $2.5 \cdot 2$; $4 \cdot 1.2$
 $0.4 \cdot 0.1$; $0.03 \cdot 10$; $4 \cdot 2.5$; $0.2 \cdot 5$; $1.3 \cdot 3$; $18 \cdot 0.1$

6. Evaluate by the most convenient way:

a. $2 \cdot 3.8 \cdot 5$; b. $2.5 \cdot 0.061 \cdot 4$; c. $6.54 \cdot 0.25 \cdot 4$;

d. $0.25 \cdot 0.2 \cdot 4 \cdot 5$; e. $13.7 \cdot 0.2 \cdot 5$; f. $1.5 \cdot 2.2 \cdot 2$

7. Evaluate:

a. $\frac{3.4 + 2.8}{0.2}$; b. $\frac{1.2}{1 - 0.4}$; c. $\frac{3 + 0.5}{3 - 0.5}$; d. $\frac{4.5 - 2.71}{14.6 + 15.4}$ e. $\frac{0.04 \cdot 0.25}{0.9 - 0.88}$