DECIMALS

Adding / Subtracting

- Line the points up
- Fill in any gaps with zeros

\[ 13.1 - 5.37 \]

\[
\begin{array}{c}
  \underline{13.1} \\
  \underline{\hspace{1cm} 0} \\
  \underline{1.3} - \underline{5.0} \\
  \underline{\hspace{1cm} 7.3} \\
  \underline{\hspace{1cm} 7.73} \\
\end{array}
\]

Multiplying

- No need to line up the points
- Do the sum ignoring the points
- Position the point in the answer using the rule: "number of digits after the point in the answer equals total number of digits after the point in the two numbers being multiplied".
Examples

1. \(0.03 \times 0.7 = 0.021\)

2. \(0.008 \times 0.05 = 0.00040 \approx 0.0004\)

3. \(0.23 \times 0.4 = \frac{0.23}{1} \times \frac{0.4}{1} = \frac{0.23 \times 0.4}{1 \times 1} = \frac{0.092}{1} = 0.092\)

4. \(1400 \times 0.6 = 1400 \times \frac{6}{10} = \frac{1400 \times 6}{10} = \frac{8400}{10} = 840\)

5. \(300 \times 0.29 = 29 \times \frac{300}{10} = \frac{29 \times 300}{10} = \frac{8700}{10} = 870\)

6. \(4.6 \times 2.7 = \frac{4.6}{1} \times \frac{2.7}{1} = \frac{4.6 \times 2.7}{1 \times 1} = \frac{12.42}{1} = 12.42\)
Dividing

To divide a decimal by a whole number, we just need to keep the points in line.

\[
\begin{array}{c}
0.2 \cdot 4 \, 3 \, 5 \\
8 \overline{)1.9 \cdot 3 \, 4 \, 2 \, 8 \, 4}
\end{array}
\]

We can add zeroes as required here.

If we have to divide by a decimal, we need to change the sum first so that we divide by a whole number.

Examples

1. \(0.8 \div 0.02\)

This is

\[
\frac{0.8}{0.02} = \frac{80}{2} = 40
\]

2. \(0.324 \div 0.4\)

\[
\begin{array}{c}
0.324 \\
0.4
\end{array}
\]

We only need to make the bottom into a whole number.

Answer \(0.81\)
Rounding off

Sometimes a number will have more decimal places than we need.

In this case we can round it off using the rule:
- if the next digit is 5 or above, round up
- if it is 4 or below, don't round up.

E.g. 1.47532 to 2 decimal places

\[= 1.48\]

This number is 5 so increase the 7 by 1

2. 14.8496 to 1 decimal place

\[= 14.8\]

3. 14.8496 to 3 decimal places

\[= 14.850\]

We round the 9 up to 10, so we carry 1 onto the 4
4. Work out \( \frac{38}{7} \) to 2 decimal places

\[
\begin{array}{c}
0.5428 \\
7 \\
38.000
\end{array}
\]

We can stop after 3 decimal places because we can now see whether we need to round up.

Answer: 5.43