

Practice on Significant Figures in Operations

Significant figures are a way of communicating the precision of a measurement; when the measurements are used to make calculations, this level of precision is carried through too. Scientists do this through the use of certain rules.

Using Significant Figures in Multiplication and Division

For multiplication and division, you must count the number of significant digits in each number to be multiplied or divided. Then, choose the smallest number of significant digits. This is the number of significant digits that should appear in your answer. For example, $12.32 \text{ cm} \times 4.2958 \text{ cm} \times 0.12 \text{ cm} = 4 \text{ sig figs} \times 5 \text{ sig figs} \times 2 \text{ sig figs}$. So, your answer should have two significant figures.

Practice: What is $12.34 \text{ g} / 6.29 \text{ mL}$?

- ☐ 1.9
- ☐ 1.96
- ☐ 1.962
- ☐ 1.961844

Check Answer

Clear

Practice: What is $0.00402 \text{ cm} \times 13.00 \text{ cm} \times 4306 \text{ cm}$?

- ☐ 220
- ☐ 230
- ☐ 225
- ☐ 225.0

Check Answer

Clear

Practice: What is $0.17362 \times 31.22 \times 170.06$?

- ☐ 922
- ☐ 921.8
- ☐ 921.80
- ☐ 921.796

Check Answer

Clear

Practice: What is $9.042 / (5.24 \times 9.5)$?

- ☐ 0.2
- ☐ 0.18
- ☐ 0.181
- ☐ 0.1816

Using Significant Figures in Addition and Subtraction

For addition and subtraction, evaluate each number to see what place the last significant digit is in. For example, the number 12.34 has the last significant digit in the hundredths place. Arrange the numbers in column form (as you did when you learned to add numbers by hand) and circle the last significant digit. The last significant digit in the answer will be in the same place as the leftmost circle. This really isn't as hard as it sounds. Let's look at an example.

$$3.200 + 0.4968 + 24$$

(Last significant digit is in bold) $3.200 + 0.4968 + 24$

(Arrange in column form)

$$\begin{array}{r} 3.200 \\ 0.4968 \\ +24 \\ \hline 27.6968 \end{array}$$

The answer would be 28; the last significant digit must be in the ones place.

Practice: $1.195 + 1320 + 41.263 =$

- ☐ 136
- ☐ 1360
- ☐ 1362
- ☐ 1362.5

Practice: $9.026 - 9.019 =$

- ☐ 0.007
- ☐ 0.0070
- ☐ 0.00700
- ☐ 0.007000

Practice: $150 + 1 + 0.182 =$

- ☐ 100
- ☐ 150
- ☐ 151
- ☐ 151.2

Practice: $0.0428 + 1.00492 =$

- ☐ 1.04

- ☐ 1.05
- ☐ 1.047
- ☐ 1.0477

Rounding rules

When performing operations such as above, it is often necessary to round numbers. After performing the operation and determining the correct number of significant figures, identify the digits that need to be rounded. There are three possibilities.

1. The digit(s) to be rounded off are less than 5 (or 0.5, or 0.05). The digits to be rounded then must begin with a 0, 1, 2, 3, or 4. Round these numbers down.

Practice: Round 442 to two significant figures.

- ☐ 400
- ☐ 440
- ☐ 442
- ☐ 450

Practice: Round 0.0539 to one significant figure.

- ☐ 0
- ☐ 0.0
- ☐ 0.05
- ☐ 0.06

2. The digit(s) to be rounded off are equal to or more than 500 (or 0.500, or 0.050). Round these numbers up.

Practice: Round 4501 to one significant figure.

- ☐ 4000
- ☐ 5000

Practice: Round 0.060185 to three significant figures.

- ☐ 0.06
- ☐ 0.0601
- ☐ 0.0602
- ☐ 0.06018

Practice: Round 0.006251 to four significant figures.

- ☐ 0.006
- ☐ 0.0062
- ☐ 0.00625
- ☐ 0.006251

Check Answer

Clear

Practice: Round 1.53499 to two significant figures.

- ☐ 1.5
- ☐ 1.53
- ☐ 1.535

Check Answer

Clear

[Using Significant Figures](#)

Send all comments, questions, suggestions, or request for noncommercial use to sdana@mail.mcps.org