Significant Figures

How to Determine the Number of Significant Figures in a Measurement

Rule 1 All nonzero digits are significant.

Examples:

254 cm	3 significant figures
72.323 g	5 significant figures
4.912 mL	4 significant figures

Rule 2 A zeroes between nonzero digits are significant.

Examples:

204 cm	3 significant figures
70.323 g	5 significant figures
40.02 mL	4 significant figures

Rule 3 All zeroes to the left of the first nonzero digit are NOT significant.

Examples:

0.823 cm	3 significant figures
0.00179 g	3 significant figures
0.2208 mL	4 significant figures

Rule 4 All zeroes to the RIGHT of the last nonzero digit and to the RIGHT of the decimal point are significant.

Examples:

71.0 cm	3 significant figures
60.00 g	4 significant figures
0. 20 mL	2 significant figures

Rule 5 Zeroes to the right of the last nonzero digit but to the left of the decimal point may or may not be significant. You must look for the decimal point and decide if it is shown or not shown.

Decimal Point SHOWN	=	zeroes ARE significant
Decimal Point NOT SHOWN	=	zeroes are NOT significant

Examples:

420 cm	2 significant figures
650. g	3 significant figures
8000 mL	1 significant figure

Rule 6 Scientific Notation
All digits in front of the x 10 ARE significant.

Examples:

1.59×10^{6} cm	3 significant figures
4.000×10^{-3} cm	4 significant figures
9.010×10^{4} cm	4 significant figures

Calculating With Significant Figures

ADDITION & SUBTRACTION

RULE With decimal points aligned, the LEAST number of decimal places among the measurements determines the number allowed in the answer.

Examples:

```
    5.34   cm
   10.7    cm
+140.287   cm
156.327    cm      mathematical calculation

156.3  cm          correct answer
```

```
  100.0225   cm
- 10.7       cm
  89.3225    cm   mathematical calculation

  89.3  cm        correct answer
```

```
1000.0     g
  - 0.015  g
999.985    g       mathematical calculation

1000.0     g       correct answer
```

MULTIPLACATION & DIVISION

RULE Count the number of significant figures in each number involved. The answer will have the same number of significant figures and the LEAST of these factors.

Examples:

```
   10.0    cm     3 significant
x   5.0    cm     2 significant
   50.     cm²    correct answer rounded to 2 significant figures
```

90. 25 cm²	=	4 significant	=	56.40625	=	56
1.6 cm		2 significant		mathematical calculation		correct answer rounded to 2 significant figures