

Significant Digits

- 1. Digits other than zeroes are always significant.**

967 has ____ significant digits

96.7 has ____ significant digits

9.6 has ____ significant digits

- 2. Zeroes between two other significant digits are always significant.**

9.067 has ____ significant digits

9.007 has ____ significant digits

- 3. Zeroes at the beginning of a number are never significant. They merely indicate the position of the decimal point.**

0.02 has ____ significant digits

0.00026 has ____ significant digits

0.000204 has ____ significant digits

- 4. When a number ends in zeroes before the decimal point, the zeroes are non-significant.**

150 000 000 has ____ significant digits

130 has ____ significant digits

800. has ____ significant digits

- 5. Zeroes that fall at the end of a number and after the decimal point are always significant.**

0.200 has ____ significant digits

3.0 has ____ significant digits

0.20030 has ____ significant digits

- 6. Round down if below 5, up if above 5.**

0.643876 with 2 significant digits gets rounded to ____

0.469436 with 2 significant digits gets rounded to ____

Round off each of the following to the number of significant figures (s.f.) indicated:

34.9255 to 3 significant figures.

0.09 31 to 2 significant figures.

4.6039 to 3 significant figures.

52 196.92 to 2 significant figures.

0.00043900 to 4 significant figures.

3394.2 to 1 significant figures.

93500 to 3 significant figures.

21.999 to 2 significant figures.

Write the number of significant digits beside each value

6340000

2 940

0.000 076 *s*

12 300

0.332

104.080 *J*

67.1

6.310

0.80 *kg*

713

104

301.5 *kg*

91

5 240

789 *mm*

400.0

0.000 051

$5.60 \times 10^2 \text{ m/s}^2$

11.400

3.95

56.02 *m*

7600

104

$4.24 \times 10^3 \text{ m}$

0.000967

8.000

5.00 *cm*

0.00005810

132

0.050 *m*

8.14

52 401 100

$2.999 \times 10^6 \text{ m/s}$

48

37.2 *m*

$9.7 \times 10^{-10} \text{ m}$

400

56 *cm*

0.00015

Addition and Subtraction:

The sum or difference should be **rounded to the same decimal place as the least precise measurement**.

Perform each of the following mathematical operations, expressing the answers to the correct number of significant digits.

$$76.0\text{ m} - 56.72\text{ m}$$

$$18.77 + 8.75 - 20$$

$$15.91 + 9.2$$

$$362.66 - 29.2$$

$$79.3 - 9.094$$

$$4005.34 - 325.2600$$

$$12.03 - 0.0264$$

$$0.00076 - 0.00060000$$

$$0.0190 + 0.0010$$

$$14.65\text{ g} + 256.5\text{ g} + 0.645\text{ g}$$

$$10.03 + 9.128 + 72.4$$

$$37.2 + 0.12 + 363.55$$

Multiplication and Division:

In multiplication and division, the answer **must have the same number of significant figures as the value with the fewest significant figures**.

Perform each of the following mathematical operations, expressing the answers to the correct number of significant digits.

$$2.4 \times 6.0$$

$$0.23 \times 0.350 \times 4$$

$$55 \times 0.540 \times 326$$

$$(55)(0.54)(326)$$

$$(0.0060)(55.1)(26)$$

$$0.025 \times 0.82$$

$$9000 \times 15.62$$

$$3 \text{ kg} \times 6 \text{ m/s}$$

$$0.24 \text{ A} \times 3.56 \text{ V}$$

$$2.6 \text{ N} \times 0.43$$

$$40.0 \div 8.02$$

$$16.55 \div 4$$

$$10.30 / 4.2571$$

$$\frac{750}{3.0}$$

$$\frac{0.452}{0.014}$$

$$\frac{0.094 \times 720}{4.4}$$

$$\frac{((6.21)(0.45))}{5.0}$$

$$\frac{((0.94)(720))}{4.4} \cdot 2.52$$

$$\frac{4.91}{2}$$

$$3.12 + \frac{9.651}{2}$$

$$\frac{4.251}{2} - \frac{2.11}{2}$$

$$0.000\,0400 \times 5.00 \times 90.0$$

$$(1.002 \times 10^{13}) \times (9.97 \times 10^{12})$$