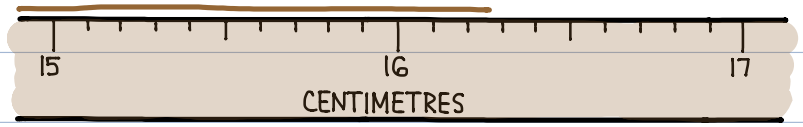
SIGNIFICANT FIGURES

- SIGNIFICANT FIGURES ARE THE MEANINGFUL DIGITS IN ANY MEASURED OR COMPUTED VALUE.
- IN A MEASURED VALUE, THE SIGNIFICANT FIGURES INCLUDE ALL CERTAIN DIGITS (I.E. READ ON THE INSTRUMENT SCALE) PLUS ONE UNCERTAIN DIGIT WHICH IS ESTIMATED BETWEEN THE SMALLEST SCALE DIVISIONS.

EXAMPLE



LENGTH OF STICK = 16.28 cm
CERTAIN ESTIMATE

- COUNTING SIGNIFICANT FIGURES:
  1. ALL NON-ZERO DIGITS ARE SIGNIFICANT.

EXAMPLE

4.357	4 S.F.
152.63	5 S.F.

2. ZEROS AT THE BEGINNING OF A NUMBER ARE NOT SIGNIFICANT.

EXAMPLE

0.00215	3 S.F.
0.006	1 S.F.

3. TRAILING ZEROS IN A NUMBER WITHOUT A DECIMAL POINT ARE NOT SIGNIFICANT.

EXAMPLE

1200	2 S.F.
345000	3 S.F.

4. TRAILING ZEROS IN A NUMBER WITH A DECIMAL POINT ARE SIGNIFICANT.

EXAMPLE

78.200	5 S.F.
20.0	3 S.F.

5. ALL ZEROS BETWEEN SIGNIFICANT FIGURES ARE SIGNIFICANT.

EXAMPLE

5050	3 S.F
9090.9	5 S.F.

6. IN SCIENTIFIC NOTATION, ALL DIGITS ARE SIGNIFICANT.

EXAMPLE

2.304×10^{-2} 4 S.F.

1.00×10^{7} 3 S.F.

EXAMPLE

IDENTIFY THE NUMBER OF SIGNIFICANT FIGURES.

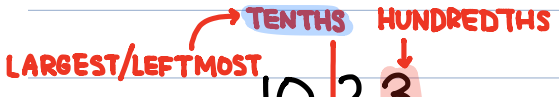
1. 7002
2. 8.2704
3. 98700
4. 0.00730
5. 321.0123
6. 0.03210
7. 730.01
8. 77800.0
9. 9.870×10^{-3}
10. 7 000 000 000

- ADDING AND SUBTRACTING:
  - YOUR ANSWER CAN BE NO MORE PRECISE THAN THE LEAST PRECISE VALUE USED. (PRECISION IS THE FINENESS OF A MEASUREMENT, I.E. THE NUMBER OF DECIMAL PLACES / SMALLEST SIGNIFICANT PLACE VALUE.)

EXAMPLE

$$\begin{array}{r} 10.23 \\ +\ 3.2 \\ \hline 13.43 \end{array}$$

① IDENTIFY THE SMALLEST SIGNIFICANT PLACE VALUE OF EACH VALUE USED.



$$\begin{array}{r} 10.23 \\ +\ 3.2 \\ \hline 13.43 \end{array}$$

② IDENTIFY THE LARGEST OF THOSE PLACE VALUES (LEFTMOST).

$$\begin{array}{r} 10.23 \\ +\ 3.2 \\ \hline 13.43 \end{array}$$

$13.43 \rightarrow 13.4$

③ ROUND YOUR ANSWER TO THE SAME PLACE VALUE IDENTIFIED IN PART 2.

- MULTIPYING AND DIVIDING:
  - ROUND OFF TO FEWEST NUMBER OF SIGNIFICANT FIGURES IN DATA USED.

EXAMPLE

$$\begin{array}{rl} 4057 & \leftarrow 4 \text{ S.F.} \\ \times 650 & \leftarrow 2 \text{ S.F.} \\ \hline 2637050 & \end{array}$$

① IDENTIFY THE NUMBER OF SIGNIFICANT FIGURES OF EACH VALUE USED.

$$\begin{array}{rl} 4057 & \leftarrow 4 \text{ S.F.} \\ \times 650 & \leftarrow 2 \text{ S.F.} \\ \hline 2637050 & \\ \downarrow & \\ 2600000 & \end{array}$$

② ROUND YOUR ANSWER TO THE FEWEST NUMBER OF SIGNIFICANT FIGURES IN DATA USED (FROM PART 1).

EXAMPLE

$$70.4 + 31.56 = 101.96 \rightarrow 102.0$$

$$260 - 32.5 = 227.5 \rightarrow 230$$

$$2.0 \times 3.14159 = 6.28318 \rightarrow 6.3$$

2 S.F. × 6 S.F.

$$\frac{6.50}{0.15} = 4.3\overline{3} \rightarrow 4.3$$

3 S.F. / 2 S.F.