

## Calculations involving Significant Digits

Your final answer cannot be any more precise than the measurements used to determine it.

### Addition / Subtraction

$$\begin{array}{r}
 125.365 \text{ m} \\
 0.0278 \text{ m} \\
 + 1.4 \text{ m} \\
 \hline
 126.7928 \text{ m} \\
 \uparrow \text{ can only have 1 uncertain digit... round to that place value} \\
 \boxed{126.8 \text{ m}} \\
 \uparrow \text{ Round final answer to the least precise place value.}
 \end{array}$$

### Multiplication / Division

$$\begin{array}{r}
 121.3 \text{ cm} \quad (4\text{sd}) \\
 \times 5.1 \text{ cm} \quad (2\text{sd}) \\
 \hline
 1213 \\
 + 6065 \\
 \hline
 618.63 \text{ cm}^2 \\
 \uparrow \text{ can only have 1 uncertain digit... need to round to that place value} \\
 \text{2sd } \boxed{6.2 \times 10^2 \text{ cm}^2}
 \end{array}$$

least # of significant digits.

\* Your final answer will be rounded to the least number of significant digits used in the calculation.

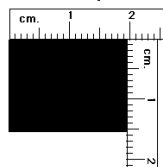
### Summary:

Add / Subtract  $\Rightarrow$  least precise place value  
 Multiply / Divide  $\Rightarrow$  least # of sds.

#### Measurement and Significant Figures

Least count of ruler is 1 mm or 0.1 cm  
 doubtful digit will be to the nearest 0.01 cm.

Actual length lies between 1.9 cm and 2.0 cm.  
 Estimated length is 1.97 cm.  
 The doubtful digit is "7".



Actual width lies between 1.5 cm and 1.6 cm.  
 Estimated width is 1.51 cm.  
 The doubtful digit is "1".

Calculated Area  
 $1.97 \times 1.51 = 2.9747$   
 which rounds to 2.97  
 (3 significant figures)

Area Range  
 Actual area lies between  $1.9 \times 1.5$  and  $2.0 \times 1.6$   
 $1.9 \times 1.5 = 2.85$   
 $2.0 \times 1.6 = 3.2$   
 so the actual area is between 2.85 and 3.2 cm<sup>2</sup>