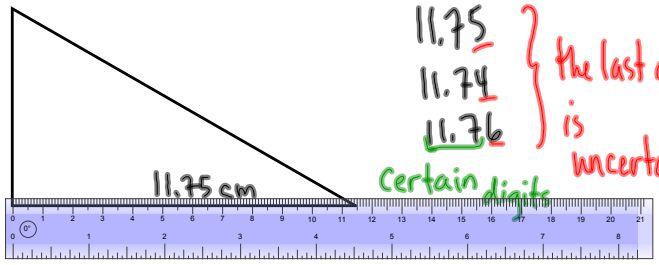
Significant Digits



11.75
11.74
11.76
} the last digit is uncertain

Certain digits

when counting sig. digs, you count the certain digits and the uncertain digit.

* There can only be one uncertain digit.

Basic Skill Sheet:

17. 2.9910 m => 5 sd

Certain ↑ uncertain

19. 0.006 70 kg => 3sd

don't count ↑ Certain ↑ uncertain

20. 809 g => 3 sd

Certain ↑ uncertain

18. 5600 km => 2sd (? 3sd or ? 4sd)

which is the uncertain digit ?

=> we cannot tell which digit is uncertain the way this is written

5600. km => 4sd

5600 km => 4sd

5.600×10^3 km => 4sd

5.60×10^3 km => 3sd

5.6×10^3 km => 2sd

* depends on the preciseness of the measuring instrument

Addition & Subtraction

$12.25\ g + 4.029\ g + 439\ g = ?$

12.25 g	(4sd)	Round the final answer to the least precise place value
4.029 g	(4sd)	
+ 439 g	(3sd)	
455.279 g		455 g

↑ can only have 1 uncertain digit.

Multiplication & Division

$12.43\ m \times 3.1\ m = ?$

$$\begin{array}{r} 12.43\ m \quad (4sd) \\ \times \quad 3.1\ m \quad (2sd) \\ \hline 1243 \\ 3729 \\ \hline 38.533\ m^2 \end{array}$$

uncertain

can only have one uncertain

$39\ m^2$ (2sd)

Round the final answer to the least number of sig. digs used in the calculation.

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4sd

21. $\frac{2.674\ m}{2.0\ m} = 1.337$

2sd ↑ $\doteq 1.3$

22. $5.25\ L \times 1.3\ L = 6.825\ L^2$ ← 2sd

3sd 2sd

$\doteq 6.8\ L^2$

What if this were:

$5.25\ L \times 1.30\ L = 6.825\ L^2$ ← need 3sd

$\doteq 6.83\ L^2$?

$\doteq 6.82\ L^2$?

↑ even

* round to the even #

$6.835\ L^2$

6.84

23. $9.0\ cm + 7.66\ cm + 5.44\ cm$

$= 22.10\ cm$

$= 22.1\ cm$

24. $10.07\ g - 3.1\ g = 6.97\ g$

$\doteq 7.0\ g$

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