One Page Lesson: The TWO Rules for using Significant Figures in Calculations

1. When multiplying or dividing: Your final result *cannot* be *any more precise* than the *least precise value* used in the calculation. The *least precise value* is the one with the *fewest significant figures.*

Seven	Sig Figs	1123.123	**Reported Answer**
Three	Sig Figs	0.0000123	**0.015**
Two	Sig Figs	**X** 1.1	*Two* **Significant Figures**
		0.01519585419	

2. When adding or subtracting: Your final result *cannot* have *any greater significance* than the *least significant value* used to produce the result. Another way to say this is that the *digit that contains the uncertainty* in the *result* is dictated by the *least significant value* used in the calculation – the one with the *uncertainty in the highest decimal place.*

1123.1|23	**Reported Answer:**		1123.1|23	**Reported Answer:**
− 0.0|00012	**23.0**		0.0|000123	**1124.2**
− 1100.1|	(uncertainty in the		+ 1.1|	(uncertainty in the
23.0|22987	*tenths* place)		1124.2|230123	*tenths* place)

Realize that your calculator does *NOT* know how to apply the significant rules after it has completed the calculation. This means that *YOU MUST be smarter than your calculator!*

For example, if you multiply two values that contain 3 and 4 significant figures, respectively, the result of your calculation is limited to just *three* significant figures. The display in your calculator may be able to show as many as seven or eight digits, but *YOU must* round to *only three* significant figures, and report the rounded value as your result. In doing this, you're indicating that the uncertainty in your result is in the *third* digit.

On occasion, you may multiply two values together (containing, as in the example above, 3 and 4 significant figures) to find that your calculator displays a result that has *fewer* digits in it than either of the numbers that you entered (perhaps it displays only two digits). Again, *YOU MUST be smarter than your calculator!* In this situation, you should realize that the two numbers just happened to multiply to yield a very simple value, and that you're entitled to *add one trailing zero* so that the final result that you report has *three* significant figures (with the uncertainty in the *third* digit).

A note on rounding to the appropriate number of significant figures: When an answer needs to be expressed with *fewer* significant figures than are shown on the calculator, here are the rounding rules to follow: If the digit immediately to the right is ≥ 5, round *up*. If it is < 5, just *drop* the extra digits.

Rounding each of these numbers to THREE significant figures			
Original number: 1.23124	0.013968	1.675	0.0003245
Rounded number: **1.23**	**0.0140**	**1.68**	**0.000325**