

Worksheet 1 - Calculations


Significant Figures - the number of significant figures (sig. fig.) is a measure of the degree of **uncertainty** in a measurement. There is experimental uncertainty in the last significant figure of a measurement. The rules for sig. fig. are given in Chapter 1.5. All non-zero numbers are significant. Zeros between numbers are significant. Zeros to the left of numbers are not significant. Zeros to the right of numbers may be significant (in presence of a decimal point).

1. Express each of the following numbers in **scientific notation** and decide the number of significant figures:

	Scientific notation	sig.fig.
409.10	_____	_____
4091.00	_____	_____
0.004091	_____	_____
308,000	_____	_____
30,860.	_____	_____
0.00056030	_____	_____

Calculations with significant figures - In **multiplication** or **division**, the number of sig. fig. in the answer has only as many sig. fig. as the factor with the smallest number of sig. fig.


$$\frac{(0.46307)(0.0805)}{(63.54)(0.052)(2.809)} = 0.004016430$$


 2 sig. fig. - limiting factor

which rounds to .0040 or 4.0×10^{-3} (2 sig. fig.)

In **addition** and **subtraction**, the answer should be reported to the same number of decimal places as the term with the least number of decimal places.

$$37.598 - 36.76 = 0.838$$


 2 decimal places - limiting factor

which rounds to 0.84 or 8.4×10^{-1}

Do addition and subtraction first. When rounding, numbers ≥ 5 are rounded up. Do not round until the **end** of the calculations.