

## Error Propagation

There's always one or two error propagation problems on each exam. They're easy if you know the formulae.

If  $x$  and  $y$  have Gaussian\* uncertainties  $\Delta x$  and  $\Delta y$ ,

$$(1) \quad \Delta(x+y) = \sqrt{(\Delta x)^2 + (\Delta y)^2}$$

$$(2) \quad \Delta(xy) = \sqrt{(x\Delta y)^2 + (y\Delta x)^2}$$

$$(3) \quad \Delta(x^a) = |a|x^{a-1}\Delta x$$

\* Always true but rarely explicit on F=ma

Note:  $(\Delta x)^2 \neq \Delta(x^2)$

Don't write  $\Delta x^2$ !

HW: read about & use relative uncertainties to solve F=ma 2018B #19