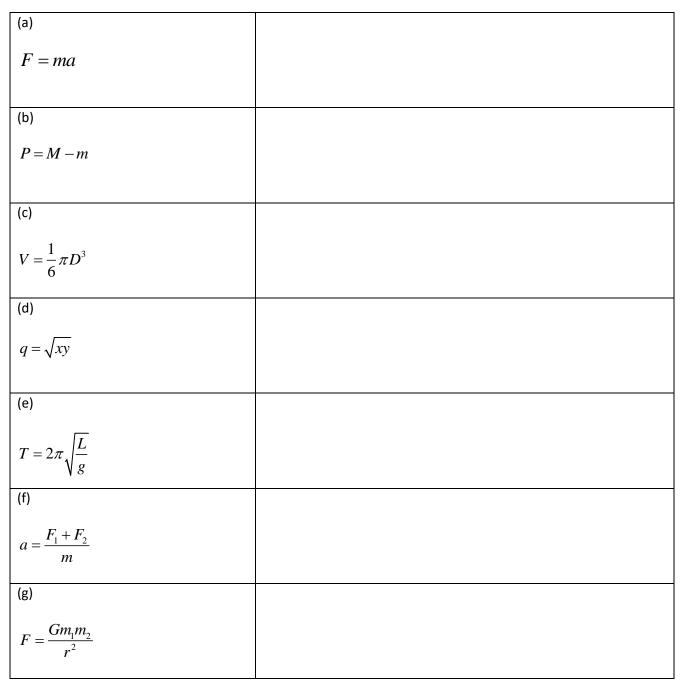
PHYS 1125 Lab 00 Worksheet: Uncertainty Propagation

1. Using the rules for uncertainty propagation, determine either the absolute or relative uncertainty (use your judgement) of the left-hand-side quantity of each expression. Only explicit numbers are assumed to have zero uncertainty. [Think if any reformatting of the expression is necessary before applying a rule.]



2. Calculate the value of $q \pm \delta q$, where $q = \frac{3AB}{C}$, $A = (3.3 \pm 0.5) \text{m}^2$, $B = (2.5 \pm 0.1) \text{m}$ and $C = (4.1 \pm 0.2) \text{m}$.

3. For the same values in question 2, calculate $Q \pm \delta Q$, where Q = A + BC. [Hint: Let D = BC and find its (absolute) uncertainty. Use your result to find the uncertainty of the given sum, Q.]

4. A kinematics equation that, if not familiar to you already will become soon, is: $x = x_0 + v_{0x}t + \frac{1}{2}a_xt^2$. For $x_0 = (5.3 \pm 0.1)$ m, $v_{0x} = (8.4 \pm 0.2)$ m/s, $t = (4.15 \pm 0.21)$ s and $a_x = (1.1 \pm 0.2)$ m/s², calculate $x \pm \delta x$. [Again, it is recommended that you find the uncertainty of $x_1 = v_{0x}t$ and $x_2 = \frac{1}{2}a_xt^2$ first.]