RULES FOR PROPAGATION OF UNCERTAINTY

These are approximate rules that simplify the computation and slightly exaggerate the uncertainty at each step.

1. Addition and Subtraction:
    e.g.
        $(4.35 \pm 0.02)\, Hz + (2.12 \pm 0.01)Hz$
        $= (6.47 \pm 0.03)Hz$
        RULE: Add absolute uncertainties
2. Multiplication and Division:
    e.g.
        $(44.01 \pm 0.05)\, m/(2.1 \pm 0.05)s$
        $= (44.01m \pm 0.11\%)/(2.1s \pm 2.4\%)$
        This was derived by taking the $\pm$ value and dividing it by the given value and then multiplying by 100 to get a percentage.
        For the above:
        $0.05/44.01 = 0.11\%$ and $0.05/2.1 = 2.4\%$
        After this is done, the two *percent* uncertainties are added:
        $0.11 + 2.4 = 2.5$
    e.g.
        $(44.01 \pm 0.05)m/(2.1 \pm 0.05)s$
        $= 21.m/s \pm 2.5\%$
        To finish the problem, the *percent* uncertainty must be converted back into the absolute uncertainty:
        $(21)(2.5\%) = 0.525$ but to one significant digit: ± 0.5
        Therefore:
    e.g. $(44.01 \pm 0.05m/(2.1 \pm 0.05)s$
        $= 21.m/s \pm 0.5$
3. Multiplying or Dividing by a pure number (with no uncertainty):
    e.g.
        $(12.3 \pm 0.1)m\, (3.00)$
        $= 36.9m \pm 0.3$
        RULE: Multiply or divide the absolute uncertainty by the pure number
4. Taking the square root:
    e.g. $\sqrt{25 \pm 5\%} = 5 \pm 2.5\%$
        RULE: divide the percent uncertainty by 2