University Physics 1 and 1A: Equation Sheet for Exam 1

Equations

$x = x_o + v_o t + \frac{1}{2}at^2$

$v = v_o + at$

$v^2 = {v_o}^2 + 2a(x - x_o)$

$x - x_o = \frac{1}{2}(v_o + v)t$

for a quadratic equation of the form

$0 = ax^2 + bx + c$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Units and Constants

$g = 9.8$ m/s^2 $= 32$ ft/s^2

60 mph = 88 ft/s

1 mile = 1609 m

1 inch = 2.54 cm

Uncertainties

Addition or Subtraction

For $Q = x + y - z + C_1$

$\Delta Q = \Delta x + \Delta y + \Delta z$

Multiplication or Division

For $Q = C_1 xy/z$

$$\frac{\Delta Q}{Q} = \frac{\Delta x}{x_{avg}} + \frac{\Delta y}{y_{avg}} + \frac{\Delta z}{z_{avg}}$$

Powers

For $Q = C_1 x^m y^n$

$$\frac{\Delta Q}{Q} = |m|\frac{\Delta x}{x_{avg}} + |n|\frac{\Delta y}{y_{avg}}$$

Other Functions

Follow the general rule—pick values to make Q as large as possible then subtract the average value of Q.