

SCIE 2320 Scioli
Formulae & constants

change in distance:

$$\Delta d = d_f - d_i$$

change in time:

$$\Delta t = t_f - t_i$$

change in velocity (acceleration):

$$v = \Delta d / \Delta t = (d_f - d_i) / (t_f - t_i)$$

$$\Delta v = v_f - v_i$$

$$a = \Delta v / \Delta t = (v_f - v_i) / (t_f - t_i)$$

velocity of accelerating object:

$$v_f = v_i + at$$

$$\text{(if } v_i = 0, v_f = at)$$

velocity of object accelerating due to Earth's gravitational pull:

$$v_f = v_i + gt$$

$$\text{(if } v_i = 0, v_f = gt)$$

$$v = \frac{1}{2} (v_i + v_f)$$

distance covered by accelerating object:

$$d_f = d_i + vt$$

$$\text{(if } d_i = 0, d_f = vt)$$

$$d_f = d_i + v_i t + \frac{1}{2} at^2$$

$$\text{(if } v_i = 0, d_f = d_i + \frac{1}{2} at^2,$$

$$\text{if also } d_i = 0, d_f = \frac{1}{2} at^2)$$

distance covered by object accelerating due to Earth's gravitational pull:

$$d_f = d_i + v_i t + \frac{1}{2} gt^2$$

$$\text{(if } v_i = 0, d_f = d_i + \frac{1}{2} gt^2,$$

$$\text{if also } d_i = 0, d_f = \frac{1}{2} gt^2)$$

F = mass x acceleration

F = weight = mass x g

density = mass / volume

p = mass x velocity

W = Force x distance

P = Work / time = (Force x distance) / time

$$E_k = \frac{1}{2} \times \text{mass} \times \text{velocity}^2$$

$$E_p = \text{mass} \times g \times \text{height}$$

$$E_{\text{total}} = E_p + E_k$$

$$\text{Eff} = ((T_{\text{HOT}} - T_{\text{COLD}}) / T_{\text{HOT}}) \times 100$$

$$F_G = G(m_1 m_2 / d^2)$$

$$G = 6.67 \times 10^{-11} \text{ Nm}^2/\text{kg}^2$$

$$F_E = k(q_1 q_2 / d^2)$$

$$k = 9 \times 10^9 \text{ Nm}^2/\text{C}^2$$

$$q_{\text{electron}} = -1.6 \times 10^{-19} \text{ C}$$

$$q_{\text{proton}} = +1.6 \times 10^{-19} \text{ C}$$

$$^{\circ}\text{F} = 9/5 ^{\circ}\text{C} + 32$$

$$^{\circ}\text{C} = 5/9 (^{\circ}\text{F} - 32)$$

$$^{\circ}\text{K} = ^{\circ}\text{C} + 273$$

$$E = mc^2$$

velocity of a wave:

$$v = \text{wavelength} \times \text{frequency}$$

velocity of light wave through a vacuum:

$$c = 3.0 \times 10^8 \text{ m/s}$$

velocity of sound (sea level, standard atmospheric conditions):

$$344 \text{ m/s}$$

$$\text{Avogadro's \#} = 6.022 \times 10^{23}$$

$$m_{\text{electron}} = 9.11 \times 10^{-31} \text{ kg}$$

$$m_{\text{proton}} = m_{\text{neutron}} = 1.67 \times 10^{-27} \text{ kg}$$

$$g = 9.8 \text{ m/s}^2$$