

Physics Equation Sheet

1 – D Kinematics

1. $v = d / t$
2. $a = v_f - v_i / t$
3. Slope = $y_2 - y_1 / x_2 - x_1$
4. Area = (b) (w) -- Rect
5. Area = (.5) (b) (h) --- Tri
6. Area = (.5) (b) (h₁ + h₂) --- Trap
7. $F = (m) (a)$
8. $d = (v_i * t) + (.5 * a * t^2)$
9. $v_f^2 = v_i^2 + (2 * a * d)$
10. $v_f = v_i + (a * t)$
11. $d = (v_i + v_f / 2) * t$

2 – Newton's Law

1. $F_{\text{gravity}} = (m) (g)$
2. $F_{\text{friction}} = (\text{coefficient}) (F_{\text{normal}})$
3. $F_{\text{net}} = F_{\text{contact}} - F_{\text{friction}}$
 $= F_{\text{tension}} - F_{\text{gravity}}$
 $= F_{\text{applied}} - F_{\text{friction}}$
 $= (m) (a)$

3 – Vectors

- 90 degree angel
 - o $a^2 + b^2 = c^2$
- $s = o/h$; $c = a/h$; $t = o/a$
- 1. **Horizontal Displacement**
 - $x = v_{ix} * t + (.5 * a_x * t^2)$ OR $x = v_{ix} * t$
 - $v_f = v_{ix} + (a_x * t)$
 - $v_f^2 = v_{ix}^2 + (2 * a_x * x)$

*** $a_x = 0 \text{ m/s}^2$ ***

2. Vertical Displacement

- $y = v_{iy} * t + (.5 * a_y * t^2)$
- $y_{\text{peak}} = v_{iy} * t_{\text{up}} + (.5 * a_y * t_{\text{up}}^2)$
- $v_f = v_{iy} + (a_y * t)$
- $v_f^2 = v_{iy}^2 + (2 * a_y * y)$
- $t_{\text{up}} = v_{iy} / g$
- $t_{\text{total}} = 2 * t_{\text{up}}$

*** $a_y = -9.8 \text{ m/s}^2$ ***

*** Horiz Projectile: $v_{iy} = 0 \text{ m/s}$ ***

4 – Momentum

1. $p = (m) (v)$
2. Impulse = $(F) (t)$
3. $(F) (t) = (m) (v)$
4. $(F_1) (t_1) = - (F_2) (t_2)$
5. $(m_1) (\Delta_1) = - (m_2) (\Delta_2)$

5 – Work, Energy, and Power

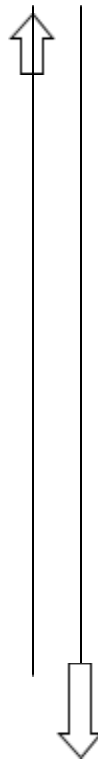
1. $W = (F) (d) (\cos\theta)$
2. $PE_{\text{gravity}} = (m) (g) (h)$
3. $F_{\text{spring}} = (k) (x)$
4. $PE_{\text{spring}} = (.5) (k) (x^2)$
5. $KE = (.5) (m) (v^2)$
6. $TME = PE + KE$
7. $TME_i + W_{\text{ext}} = TME_f$
8. $P = W / t$ OR $P = (F) (v)$

6 – Thermal Physics

1. $^{\circ}\text{C} = (^{\circ}\text{F} - 32) / 1.8$
2. $^{\circ}\text{F} = (^{\circ}\text{C} * 1.8) + 32$
3. $^{\circ}\text{C} = \text{K} - 273$
4. $\text{K} = ^{\circ}\text{C} + 273$
5. Rate of heat transfer = $(k * A * \Delta T) / d$
 - a. k = coeff of heat transfer
6. $C_p = q / (m * \Delta t)$
7. $q = m * C_p * \Delta t$
8. $q = m * \Delta \text{Heat}_{\text{fusion}}$.. “changing states”
9. $q_{\text{total}} = q_1 + q_2 + \dots$
10. $q_{\text{ice}} = -q_{\text{surrounding}}$
11. $q_{\text{NaOH - dissolving}} = -q_{\text{calorimeter}}$
12. $q_{\text{parafin}} = -q_{\text{water}}$
13. Absolut Error = Accepted – Experimental
14. Percent Error = $V_{\text{acc}} - V_{\text{exp}} / V_{\text{acc}}$

Physics Equation Sheet

- Gravity: 9.8 m / s^2 or 9.8 N
- $G = 6.673 \times 10^{-11} \text{ N} \cdot \text{m}^2 / \text{kg}^2$
- $2.2 \text{ lbs} = 1 \text{ Kg}$
- $1 \text{ hp} = 750 \text{ watts}$
- $1 \text{ cc} = 1 \text{ ml}$
- $2.54 \text{ cm} = 1 \text{ inch}$
- $5280 \text{ ft} = 1 \text{ mile}$
- $3 \text{ ft} = 1 \text{ yd}$
- ****2.54 cm = 1 inch ****
- $1 \text{ ft} = 12 \text{ inch}$
- $365 \text{ days} = 1 \text{ yr}$
- $12 \text{ months} = 1 \text{ yr}$
- $7 \text{ days} = 1 \text{ wk}$
- Left



	Power of
10	
Tera	12
Giga	9
Mega	6
Kilo	3
Hecto	2
Deka	1
"Base"	0
deci	-1
centi	-2
milli	-3
micro	-6
nano	-9
pico	-12
femto	-18