

Physics 11 Equation Sheet

Waves

$$T = \text{time/cycles} = t/\text{cycles}$$

$$T = 1/f$$

$$f = \text{cycles/time} = \text{cycles}/t$$

$$v = f\lambda$$

Kinematics

$$v_{\text{average}} = \Delta d / \Delta t$$

$$a = \Delta v / \Delta t = \frac{v_f - v_i}{\Delta t}$$

Kinematics equations

$$v_f = a\Delta t + v_i$$

$$\Delta d = \frac{1}{2} a\Delta t^2 + v_i \Delta t$$

$$\Delta d = \frac{1}{2} (v_i + v_f)\Delta t$$

$$v_f^2 = 2a\Delta d + v_i^2$$

Forces and Dynamics

$$\Sigma F = ma$$

$$F_g = mg$$

$$F_f = \mu F_N$$

$$F_g = \frac{Gm_1m_2}{d^2}$$

$$F = k\Delta x$$

Momentum

$$p = mv$$

$$\Delta p = F_{\text{net}}\Delta t$$

$$p = p'$$

Work and Energy

$$E_p = mgh$$

$$E_k = \frac{1}{2} mv^2$$

$$W = F\Delta d$$

$$W = \Delta E_k$$

$$P = W/\Delta t = \Delta E/\Delta t$$

$$\text{Efficiency} = [W_{\text{out}}/W_{\text{in}}] \times 100\% = [P_{\text{out}}/P_{\text{in}}] \times 100\%$$

Heat Energy

$$Q = mC\Delta t$$

$$Q = mH_f$$

$$Q = mH_v$$

$$T_K = T_{\text{C}} + 273.14$$

Electric Circuits

$$V = IR$$

$$P = IV = V^2/R = I^2R$$

Constants

$$g = 9.80 \text{ m/s}^2 = 9.80 \text{ N/kg}$$

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

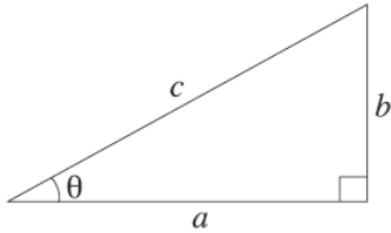
Mathematical Equations

Quadratic Formula

$$ax^2 + bx + c = 0$$

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

Right angled Triangles



$$a^2 + b^2 = c^2$$

$$\sin\theta = b/c$$

$$\cos\theta = a/c$$

$$\tan\theta = b/a$$

Metric Prefixes			
Prefix	Symbol	Numerical	Exponential
mega	M	1 000 000	10^6
kilo	k	1000	10^3
hecto	h	100	10^2
deca	da	10	10^1
		1	10^0
deci	d	0.1	10^{-1}
centi	c	0.01	10^{-2}
milli	m	0.001	10^{-3}
micro	μ	0.000001	10^{-6}

Planetary Data

Name	Average radius (m)	Mass (kg)	Distance from sun (m)
Sun	696.0×10^6	1.991×10^{30}	-----
Mercury	2.43×10^6	3.2×10^{23}	5.80×10^{10}
Venus	6.073×10^6	4.88×10^{24}	1.081×10^{11}
Earth	6.3713×10^6	5.979×10^{24}	1.4957×10^{11}
Mars	3.38×10^6	6.42×10^{23}	2.278×10^{11}
Jupiter	69.8×10^6	1.901×10^{27}	7.781×10^{11}
Saturn	58.2×10^6	5.68×10^{26}	1.427×10^{12}
Uranus	23.5×10^6	8.68×10^{25}	2.870×10^{12}
Neptune	22.7×10^6	1.03×10^{26}	4.500×10^{12}
Pluto	1.15×10^6	1.2×10^{22}	5.9×10^{12}