PHYSICS 11 FORMULAE

Wave Motion and Geometrical Optics

$$\frac{1}{d_i}+\frac{1}{d_o}=\frac{1}{f} \qquad n=\frac{c}{v}$$

$$n_1\sin(\theta_1)=n_2\sin(\theta_2)$$

$$T=\frac{1}{f} \qquad v=f\lambda$$

Kinematics

$$v=\frac{\Delta d}{\Delta t} \qquad a=\frac{\Delta v}{\Delta t}$$

$$d=\overline{v}t$$

$$v=v_0+at \qquad \overline{v}=\frac{v+v_0}{2}$$

$$d=v_0t+\frac{1}{2}at^2 \qquad v^2=v_0^2+2ad$$

Forces and Dynamics

$$F_g=mg \qquad F_g=\mathrm{G}\frac{m_1m_2}{r^2}$$

$$F_{fr}=\mu F_N \qquad F=k\Delta x$$

$$F_{net}=ma$$

$$p=mv \qquad \Delta p=F_{net}\Delta t$$

Energy

$$W=Fd \qquad W=\Delta E$$

$$E_p=mgh \qquad E_k=\frac{1}{2}mv^2$$

$$P=\frac{W}{\Delta t}=\frac{\Delta E}{\Delta t}$$

$$efficiency=\frac{W_{out}}{W_{in}}=\frac{P_{out}}{P_{in}}$$

Special Relativity

$$t=\frac{t_0}{\sqrt{1-\frac{v^2}{c^2}}} \qquad m=\frac{m_0}{\sqrt{1-\frac{v^2}{c^2}}}$$

$$l=l_0\sqrt{1-\frac{v^2}{c^2}} \qquad v_{total}=\frac{v_1+v_2}{1+\frac{v_1v_2}{c^2}}$$

$$E=mc^2$$