**Physics Formula Sheet 21-22**

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| **Kinematics** |  |  |  |
| $$v\_{avg}=\frac{∆x}{t}$$ | $$a=\frac{(v\_{f}-v\_{i})}{t}$$ | $$v\_{f}=v\_{i}+at$$ |  |
| $$∆x=v\_{i}t+\frac{1}{2}at^{2}$$ | $$v\_{f}^{2}=v\_{i}^{2}+2a∆x$$ | $$g=9.80 \frac{m}{s^{2}}$$ |  S=d/t |
| **Projectiles** |  | **Dynamics** |  |
| $$Δy=v\_{y}t+\frac{1}{2}gt^{2}$$ |  | $$ΣF=ma$$ | $$ΣF\_{R}=ma\_{c}$$ |
| $$Δx=v\_{x}t$$ |  | $$F\_{g}=mg$$ | $$a\_{c}=\frac{v^{2}}{r} $$ |
| **Vectors** |  |  |
| $$c^{2}=a^{2}+b^{2}$$ | Area of Triangle = 1/2bh |  |
| **Work and Energy** |  |  |  |
| $$W=Fdcosθ$$ | $$KE=\frac{1}{2}mv^{2}$$ | $$PE\_{g}=mgh$$ |  |
| $$P=\frac{W}{t}$$ | $$KE\_{i}+PE\_{i}=KE\_{f}+PE\_{f}$$ | $$W\_{net}= ∆KE$$ |  |
| **Gravitation and Momentum** |  |  |
| $$F\_{g}=\frac{Gm\_{1}m\_{2}}{d^{2}}$$ | $$G=6.67 x 10^{-11}\frac{N∙m^{2}}{kg^{2}}$$ | $$Circumference=2πr$$ |  |
| $$p=mv$$ | $$∆p=Ft$$ | $$m\_{1}v\_{1i}+m\_{2}v\_{2i}=m\_{1}v\_{1f}^{}+m\_{2}v\_{2f}^{}$$$$m\_{1}v\_{1i}+m\_{2}v\_{2i}=v\_{f}(m\_{1}+m\_{2})$$ |  |
| **Heat and Thermodynamics** |  |  |
| $$Q=mC\_{p}∆T$$ | $$Q=mL\_{f}$$ | $$m\_{a}c\_{a}∆T= -m\_{b}c\_{b}∆T$$ |  |
|  | $$Q=mL\_{v}$$ |  |  |
| **Waves** |  |  |  |
| $$v=λf$$ | $$T=\frac{1}{f}$$ | $$f=\frac{1}{T}$$ |  |
| $$n\_{i}sinθ\_{i}=n\_{r}sinθ\_{r}$$ | $$c=3.0 x 10^{8}\frac{ m}{s}$$ | $$\frac{1}{f}=\frac{1}{d\_{o}}+\frac{1}{d\_{i}}$$ |  |
| $$n\_{s}=\frac{c}{v\_{s}}$$$$E=hf$$ | $$M=\frac{h\_{i}}{h\_{o}}=-\frac{d\_{i}}{d\_{o}}$$*h =* 6.266 x 10-34$\frac{J}{Hz}$ | $$speed of sound in air at 25℃=343 \frac{m}{s}$$$$speed of light in vacuum = 3 x 10^{8} \frac{m}{s}$$ |
| **Electricity** |  |  |  |
| $$V=IR$$ | $$F=\frac{kq\_{1}q\_{2}}{d^{2}}$$ | $$k=9.0 x 10^{9}\frac{N∙m^{2}}{C^{2}}$$ |  |
| $$P=I^{2}R$$ | $$P= \frac{V^{2}}{R}$$ | $\frac{1}{R\_{eq}}= \frac{1}{R\_{1}}+ \frac{1}{R\_{2}} $…Req=R1+R2+… |  |

$ P=VI$ $ I= \frac{Q}{t}$ $E=k\frac{q}{r^{2}}$