**PHYSICS EQUATIONS – SEMESTER 1**

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| **EXPERIMENTAL EQUATIONS** | $$\% error=\left|\frac{\#experimental-\#actual}{\#actual}\right|\*100$$(5% Rule) $\frac{y-intercept}{greatest y value} \*100 <5\%$ |
| **CONSTANT VELOCITY** | $\rightharpoonaccent{v}=\frac{Δ\rightharpoonaccent{x}}{Δt}$ (velocity)$v=\frac{d}{t}$ (speed)$$\rightharpoonaccent{x}\_{f}=\rightharpoonaccent{x}\_{i}+\rightharpoonaccent{v}t$$ |
| **UNIFORM ACCELERATION** | $\rightharpoonaccent{a}=\frac{Δ\rightharpoonaccent{v}}{Δt}$ (acceleration)$\rightharpoonaccent{v}\_{avg}=\frac{1}{2}(\rightharpoonaccent{v}\_{i}+\rightharpoonaccent{v})$ (average velocity)*KINEMATIC EQUATIONS:* $\rightharpoonaccent{v}\_{f}=\rightharpoonaccent{v}\_{i}+\rightharpoonaccent{a}t$ $∆x=\rightharpoonaccent{v}\_{i}t+\frac{1}{2}\rightharpoonaccent{a}t^{2}$ $∆x=\frac{1}{2}(\rightharpoonaccent{v}\_{i}+$ $\rightharpoonaccent{v}\_{f})∆t$ $\rightharpoonaccent{v}\_{f}^{2}=\rightharpoonaccent{v}\_{i}^{2}+2\rightharpoonaccent{a}∆\rightharpoonaccent{x}$ |
| **FORCE** | $Σ\rightharpoonaccent{F}=m\rightharpoonaccent{a}$ (net force)$\rightharpoonaccent{F\_{g}}=mg$ (gravitational force, weight)$\rightharpoonaccent{F}\_{fk}=μ\_{k}\rightharpoonaccent{F}\_{N}$ (force of kinetic friction)$\rightharpoonaccent{F}\_{fs}\leq μ\_{s}\rightharpoonaccent{F}\_{N}$ (force of static friction) |
| **ENERGY, WORK, POWER** | $KE=\frac{1}{2}m\rightharpoonaccent{v}^{2}$ (kinetic energy)$PE\_{grav}=mgh$ (gravitational potential energy)$W=\rightharpoonaccent{F}∙∆\rightharpoonaccent{x}\cos(θ)$ or $W=\rightharpoonaccent{F}∙∆\rightharpoonaccent{x}$ (work)WORK-ENERGY $W=∆KE$THEOREM: $W=\frac{1}{2}m\rightharpoonaccent{v}^{2}-\frac{1}{2}m\rightharpoonaccent{v}\_{o}^{2}$ $\overbar{P}=\frac{W}{t}$ or $\overbar{P}=\frac{\rightharpoonaccent{F}∙∆\rightharpoonaccent{x}}{t}$ (power) |
| **MOMENTUM/ IMPULSE** | $p=m\rightharpoonaccent{v}$ (momentum)$\rightharpoonaccent{F}∙t=m∙∆\rightharpoonaccent{v}$ (impulse)$\rightharpoonaccent{F}=\frac{∆p}{t}=\frac{m∙∆\rightharpoonaccent{v}}{t}$  |