

Exam 2 formulas

To be given on exam

Continued from exam 1

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

$$\text{If } ax^2 + bx + c = 0, \quad x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

For constant a :

$$x = x_o + v_o t + \frac{1}{2} a t^2$$

$$v^2 = v_o^2 + 2a(x - x_o)$$

New for exam 2

gravity: $w = mg$, $PE_g = mgy$

friction: $f = \mu N$ (or $f \leq \mu N$, for static friction)

springs: $F = -kx$, $PE_s = \frac{1}{2} kx^2$

power $P = F \cdot v$

To be memorized

Continued from exam 1

$$\text{Definition: } v_{ave} = \langle v \rangle = \frac{\Delta x}{\Delta t}$$

$$\text{Definition: } a_{ave} = \langle a \rangle = \frac{\Delta v}{\Delta t}$$

For constant a :

$$v = v_o + at$$

$$v_{ave} = \langle v \rangle = \frac{v_i + v_f}{2}$$

New for exam 2

Newton's 2nd Law: $\sum \vec{F} = m\vec{a}$

Newton's 3rd Law: $\vec{F}_{12} = -\vec{F}_{21}$

Definition: $W = F_{\parallel} \Delta x = F \cos \theta \Delta x$

Definition: $KE = \frac{1}{2} m v^2$

Colton conservation of energy: $E_{before} + W_{net} = E_{after}$

Hess conservation of energy: $KE_i + PE_i + W_{in} = KE_f + PE_f + W_{out}$

Definition power: $P = \Delta E / \Delta t$