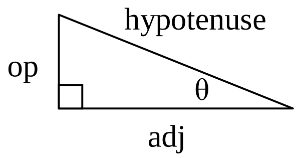
P125 Equation Sheet

These equations will be on the front page of each quiz ☺.

$\sin\theta = \frac{\text{opposite}}{\text{hypotenuse}}$ $\cos\theta = \frac{\text{adjacent}}{\text{hypotenuse}}$ $\tan\theta = \frac{\text{opposite}}{\text{adjacent}}$



$v_f = v_o + at$ $x_f = x_o + v_o t + ½ at^2$ $v_f^2 = v_o^2 + 2a\,\Delta x$ (for motion in one-dimension with constant acceleration)

$\bar{s} = \frac{d}{\Delta t}$ $\bar{v} = \frac{\Delta x}{\Delta t}$ $\bar{a} = \frac{\Delta v}{\Delta t}$

Quiz #2

$\sum \vec{F}_{ext} = m\vec{a}$ $F = \frac{GMm}{R^2}$ $a_c = v^2 / R$ You can't push on a rope. $f_s \le \mu_s n$ $f_k = \mu_k n$

Quiz #3 $K = ½ mv^2$ $PE = mgh$ $\Delta E = W_{nc}$ $E_o = E_f$

For Conservative forces:{ $W_{net} = \Delta K$, $W_{net} = -\Delta U$ } $E_{\text{lost due to friction}} = f_k d$ $Power = \frac{\text{Work}}{\text{time}}$

$W = F_x\,\Delta x$ $\vec{I} = \Delta\vec{p} = \vec{F}(t) * t$ $\vec{p} = m\vec{v}$

$\omega = \frac{\Delta\theta}{\Delta t}$ $\alpha = \frac{\Delta\omega}{\Delta t}$ $v_t = r\omega$ $\sum \vec{F}_{ext} = \frac{\Delta p}{\Delta t}$

Quiz #4 $\tau = r\,F\sin(\vec{r},\vec{F}) = Fr_\perp$ $I = \sum m_i r_i^2$

$K_{rot} = ½ I\omega^2$ $\sum\tau = \frac{\Delta L}{\Delta t}$ $PE_{spring} = ½kx^2$ $T = 2\pi\sqrt{\frac{L}{g}}$ $F_s = -kx$ $f = \frac{1}{T}$

$\omega = 2\pi f$ $v_{max} = \omega x_{max}$ $a_{max} = \omega^2 x_{max}$ $\omega = \sqrt{\frac{k}{m}}$ $v = \sqrt{\frac{T}{\mu}}$ $\mu = m/l$

$v = \lambda f$ $f_{obs} = f_{source}\left(\frac{1 \pm \frac{v_{obs}}{v_{wave}}}{1 \mp \frac{v_{source}}{v_{wave}}}\right)$

standing waves on a string fixed at both ends: $f_n = \frac{nv}{2L}$ $\lambda_n = \frac{2L}{n}$ $n = 1,2,3,\ldots$

standing waves in an air column open at both ends: $f_n = \frac{nv}{2L}$ $\lambda_n = \frac{2L}{n}$ $n = 1,2,3,\ldots$

standing waves in an air column – one end closed: $f_n = \frac{nv}{4L}$ $\lambda_n = \frac{4L}{n}$ $n = 1,3,5,\ldots$