CP - Jan 19

Forces

1 Newton amount of Force require to accelerate 1 Kg at $1 \frac{m}{s^2}$

Weight = mass × acc due to gravity

$W = mg$

example $m = 15\ Kg$

$W = 15\ Kg \left(9.8 \frac{m}{s^2}\right)$

$= 147\ N$

$F = ma$

$F_{net} = m_{sys} a$

$F_a - F_f = m_{sys} a$

Cheat sheet

allowed	not allowed
equation constants 1 m = 100 cm 2.2 lb = 1 Kg	diagrams examples words...

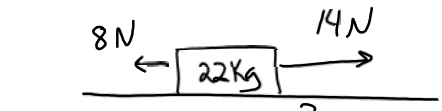
What is the acc of the Box?

$F_{net} = ma$

$8N - 3N = ma$

$5N = 14Kg\,(a)$

$\frac{5N}{14Kg} = a = \boxed{.36\ \frac{M}{S^2}}$



What is acc?

$F_{net} = m\,a$

$14N - 8N = 22Kg\,(a)$

$6N = 22Kg\,(a)$

$\frac{6N}{22Kg} = a = \boxed{.27\ \frac{m}{S^2}}$

a cart is moving at $2\ \frac{m}{s}$ and has a mass of 12Kg. If a force of 7N is applied to stop it how far until it stops? (Two parts)

$F = ma$ $\quad -7N = 12Kg\,(a)$

$\frac{-7N}{12Kg} = \boxed{-.58\ \frac{M}{S^2}}$

$V_0 = 2\ \frac{m}{s}$ $\quad V_f = 0$ $\quad a = -.58\ \frac{M}{S^2}$ $\quad d = ?$

$V_f^2 = V_0^2 + 2ad$

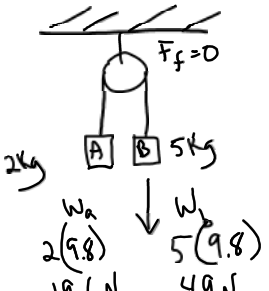
$-V_0^2 = 2ad$

$\frac{-V_0^2}{2a} = d = -\frac{(2m)^2}{2(-.58)}$

$\frac{-4m^2}{S^2} \quad 2(-.58)$

$\frac{2m^2}{S^2}\left(\frac{S^2}{.58M}\right)$

$= \boxed{3.45\ m}$



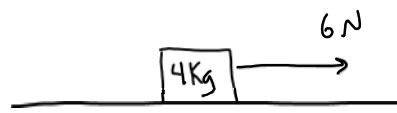
What is the acc of "B"?

$F_{net} = M_{sys}\,a$

$49 - 19.6N = 7Kg\,(a)$

$29.4N = 7Kg\,(a)$

$\frac{29.4N}{7Kg} = \boxed{a = 4.2\ \frac{m}{S^2}\ down}$



$\mu = .14$

a) What is the Force of friction?

$F_f = \mu N$

$F_f = \mu mg$

$= .14\left(4Kg\right)\left(9.8\frac{M}{S^2}\right)$

$F_f = 5.49\ N$

b) what is the acc?

$F_{net} = M\ a$

$6N - 5.49N = 4Kg\ (a)$

$\frac{.51\ N}{4Kg} = a = .13\ \frac{M}{S^2}$