Chapter 3
Physics Review For Final Exam
Answers

Formulas

$F_g = mg$

$F_f = \mu F_n$

$F = k\Delta x$

$g = 9.81\ m/s^2$

$g = 9.81\ N/kg$

a) $m_1 = 2.5\,kg$

$x_1 = 10\,cm \times \frac{1\,m}{100\,cm} = 0.10\,m$ *revised Jan 27

$F = k\Delta x$ $F = F_g = mg = (2.5)(9.81)$

$F = 24.525$

$m_2 = 5.0\,kg$

$k_2 = 2452.5$

$x_2 = ?$

$24.525 = k_1(0.1)$ *revised Jan 27

$\div 0.1$ $\div 0.1$

$245.25 = k_1$

$k_1 = k_2$

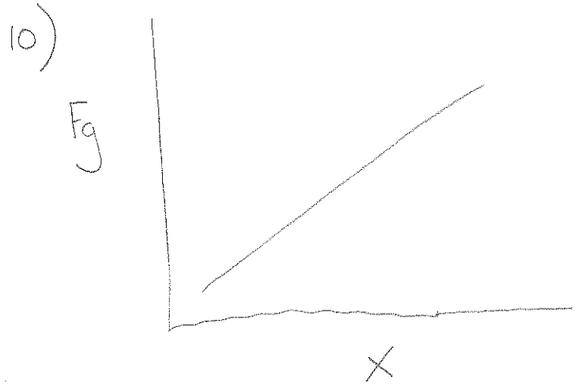
$F_2 = m_2 g = (5)(9.81)$

$F_2 = 49.05 \rightarrow 49.05 = (245.25)(x_2)$

$\div 245.25$ 245.25

$0.2\,m = x_2$ *revised Jan 27

10)



* just like $V = \frac{d}{t}$ a distance vs. time graph slope = V

a Fg vs. x = k

Spring constant

$F = k\Delta x$

$\frac{F}{\Delta x} = k$

1) $F_g = mg$ $F_g = (90)(9.81)$

$m = 90\,kg$

$g = 9.81\ m/s^2$

$F_g = 882.9\ N$

$F_g = 880\ N$

$F_g = 8.8 \times 10^2\ N$ *revised Jan 27

Weight = gravitational force = $8.8 \times 10^1\ N$

2) $F_g = 637\ N$

$g = 9.81\ m/s^2$

$m = ?$

$637 = m(9.81)$

$\div 9.81$ $\div 9.81$

$64.93 = m$

$64.9\,kg = m$

3) $F_g = 127.5\ N$

$m = 75\ kg$

$g = ?$

$127.5 = 75(g)$

$\div 75 \quad \div 75$

$1.7 = g$

$\boxed{g = 1.7\ N/kg}$

4) $F_f = \mu F_n$

$\mu = 0.25$

$F_n = 30N$

$F_f = (0.25)(30)$

$\boxed{F_f = 7.5\ N}$

5) $F_f = \mu F_n$

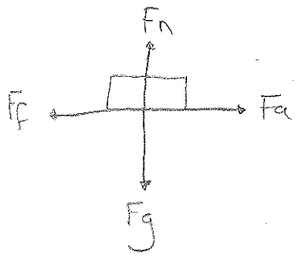
$F_n = F_g = mg$

$m = 10kg$

$\mu = 0.30$

$F_n = (10)(9.81)$

$F_n = 98.1\ N$



$F_f = (0.30)(98.1)$

$F_f = 29.43$

$\boxed{F_f = 29\ N}$

6) $\mu = 0.0100$

$F_f = 24.5$

$F_n = F_g$

$24.5 = (0.01)(F_N)$

$\div 0.01 \quad \div 0.01$

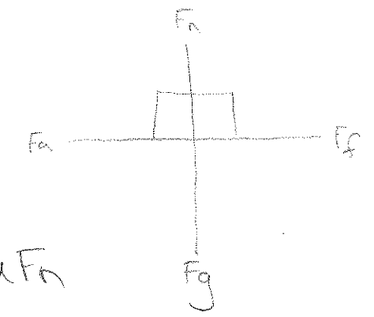
$2450 = F_n = F_g$

$\boxed{2.45 \times 10^3\ N = F_g}$

7) $F_a = 42\ N = F_f$

$F_g = 48N = F_n$

$F_f = \mu F_n$



$42 = \mu 48$

$\frac{42}{48} = \mu$ $\quad \boxed{\mu = 0.875}$

8) $F = k\Delta x$ $\quad x = 20cm \times \frac{1\ m}{100\ cm} = 0.2\ m$

$k = 3.2$

$F = (3.2)(0.20) = \boxed{0.64\ N = F}$

raised Jan 27