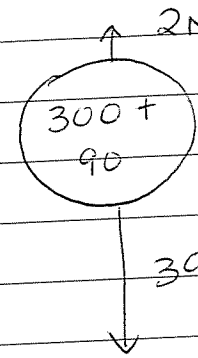
Miaterm Review - Suggested Problems

p. 844 Ch. 2

1) 

$2N - 390N = -388N$

or 388 N down

2) 

if desk doesn't move

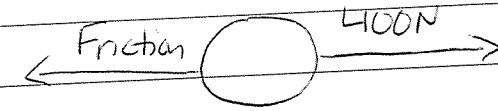
$F_{net} = 0$

For F_{net} to $= 0$,

Friction must $= 80N$

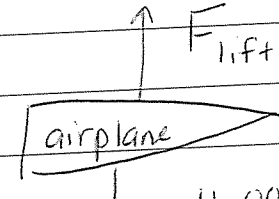
3) Again, desk is in static equilibrium so

Friction force = Applied force $= 110\ N$

4) 

Constant velocity $\rightarrow F_{net} = 0$

so Friction $= 400N$

5) 

plane flies level

so lift force = weight

↓ down

n't move

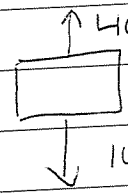
= 0,
= 80N

→ $F_{net} = 0$
400N

weight

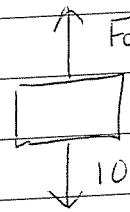
p. 844 Ch. 3

1) $40\ kg \cdot 10\ m/s^2 = 400N$

2) 

air drag = air resistance (so opposite motion)

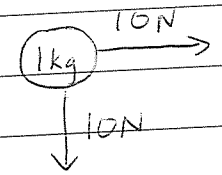
400 − 1000N = −600 N or 600N ↓

3) 

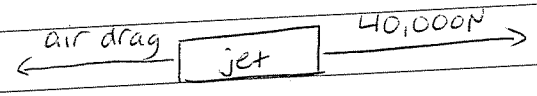
barrel moving at constant velocity
so $F_{net} = 0$
Force of H_2O must = 1000N

4) $(3\ kg)(10\ m/s^2)\left(\frac{1}{6}\right) = 5N$

6) total weight = 600N so mass = $\frac{600N}{10\ m/s^2} = 60\ kg$

8) 

$10^2 + 10^2 = 200$; $\sqrt{200} = 14\ N$

9) 

Constant velocity so $F_{net} = 0$
so air drag = 40,000 N

Page 844 Ch. 3

12) (1 kg) / liter so .5 kg for ½ liter ; $(.5\,kg)(10\frac{m}{s^2}) = 5\,N$

Page 845 Ch. 4

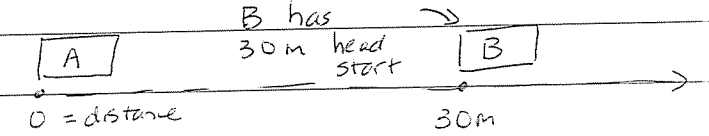
2) a) $0\ m/s$ b) $10\ m/s\uparrow$ c) $-10\ m/s$ d) $-10\ m/s$ e) $-10\ m/s^2$
f) $-10-(10) = -20\ m/s$ g) $-10\ m/s^2$

3) $a = \frac{V_f - V_i}{t} = \frac{0 - 26.7\frac{m}{s}}{4} = -6.7\ m/s^2$

distance $= \frac{1}{2}at^2 = \frac{1}{2}(-6.7)(4^2) = 53.6\,m$

5) a) $t = \sqrt{\frac{2(-1.0m}{-10\ m/s^2}} = .45\,s$ b) $V_f = at = \left(-10\frac{m}{s^2}\right)(.45) = 4.5$

6) Car A - 27 m/s
Car B - 10 m/s



distance = V·t so

They crash when d is same
(they're in same place)

$V_A \cdot t = V_B \cdot t + 30$

$27\frac{m}{s} \cdot t = 10\frac{m}{s} \cdot t + 30$

$17\frac{m}{s} \cdot t = 30$

$t = 1.8\,s$

8) a) $a = \frac{V_f - V_i}{t}$

$\frac{m}{s^2}) = 5N$

$10\ m/s^2$

$\frac{m}{s^2})(.45) = 4.5\frac{m}{s}$

]

ame

30

30

Ch 4 p 846

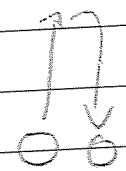
9) $v_i = 40\ m/s$ it hits max Δy when $v_f = 0$

$v_f^2 = v_i^2 + 2a\Delta y$

$0 = 40^2 - 20\Delta y$

$-1600 = -20\Delta y$

$80m = \Delta y$

11) 

total trip = 1s ↑ = .5s and ↓ = .5s

for ↓ trip $\Delta y = \frac{1}{2}at^2$

$\Delta y = \frac{1}{2}(10\frac{m}{s^2})(.5)^2$

$\Delta y = 1.25\ m$

$v_f = gt = 10(.5s)$ $v_f = 5\ m/s$

12) again 2nd part of trip $\Delta y = \frac{1}{2}a(3s)^2$

$\Delta y = 5 \cdot 9 = 45\ m$

$v_f = at = 10(3s) = -30\ m/s$

18) vel = v time = t $d = v \cdot t$

$d = 7.5\frac{m}{s} \cdot 5\ min \times 60\ \frac{s}{min}$

$d = 2250$ → rounded to 23

Ch. 5 p. 847

1) $t = \sqrt{\frac{2(8000m)}{10}} = 40s \times 250\ m/s = 10{,}000m$

2) $t = \sqrt{\frac{2(45m)}{10}} = 3s \times 12\ m/s = 36m$

3) $45\ m/s \times 3s = 135m$

10) a) blimp was moving horizontally

b) $t = \sqrt{\frac{2(60)}{10}} = 3.49s \rightarrow 3.5s$

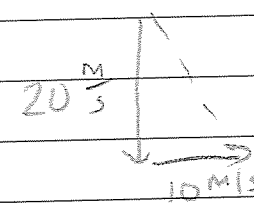
c) $3.5s \times 7\ m/s = 25m$

12) $\Delta y = \frac{1}{2} g t^2 \qquad \Delta x = v \cdot t$

$\Delta y = \frac{1}{2}(10)(.43s)^2 = .92m \qquad \Delta x = 1.2\frac{m}{s} \cdot .43s = .52$

16) in x direction: $\frac{40m}{4s} = 10\ m/s = v_x$

in y direction: ball goes ↑ for 2s & ↓ for 2s.
after 2s going down $v_y = -20\frac{m}{s}$



$v_f = \sqrt{20^2 + 10^2} \approx 22.4\ m/s$

19) km/h ✓

24) $v_f = v_i + at$

p. 850 ch. 6

1) $\frac{50N}{100kg} = .5\ m/s^2$

3) $\frac{800N}{50kg} = 16\ m/s^2$

4) $\frac{15N}{.05m^2} = 300\ Pa$

8) $F_1 = 500a$

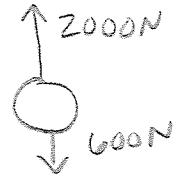
$F_2 = 1500a$

$F_2 = 3 \times F_1$

9) a) $60 \times 10\ m/s^2 = 600N$

b) $F_{net} = 0$ at terminal V

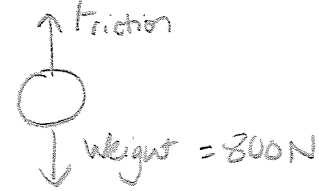
c) $a = 0$

10) 

$2000 - 600 = 1400N$ $\frac{1400N}{60kg} = 23\ m/s^2 \uparrow$

52m

14) $F = ma$

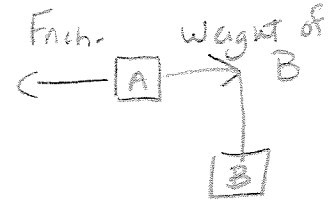


$F_{net} = F_{friction} - 800N = (80kg)(-4\frac{m}{s^2})$

$F_{friction} = -320 + 800\ N$

$= 480N \uparrow$

$\frac{m}{s}$

15) 

$F_{friction} = (m_A \cdot 10)\frac{1}{2}$

$m_B(10) - (m_B \cdot 10)\frac{1}{2} = 2m_B a$

$10 - 5 = 2a$ $5 = 2a$ $a = 2.5\frac{m}{s^2}$

23) $F = ma$ $m = \frac{F}{a}$