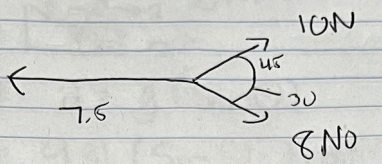
3.3 (A)



tan(45)

tan(30)

1.88 N →

F

F_1 = 40N @ 20°

F_2 = 20 N @ 40°

F net = $\sqrt{Fx^2 + Fy^2}$ = 60.57² + 32.98

Unit 2: Forces I & II

3.1 (a) $f_\perp = 1000N$, $7°$ (V'T)

$F = 2T\sin\theta$

$T = \frac{1000}{2(\sin 7)}$ → $500/\sin(7)$ → $\boxed{761.05N}$

(b) $f_f = uF_N$ $900kg / 0.05$ $\boxed{441.45}$

$761.05 - 441.45 = 319.6$

3.2 (a) $\boxed{-5.56 m/s^2}$ ✓

$V = U + at$

$S = Ut + \frac{1}{2}at^2$

$V^2 = U^2 + 2as$

$V^2 - U^2 = 2as$

$0 - (100 m/s) = 2 \times 100 \times 2$

$\frac{-(\frac{100}{3} m/s^2)}{2 \times 100m} = 2$

$-5.56/s^2 = a$

(b) $\boxed{-1.112 \times 10^5 N}$

$F = ma$

$= 20000 kg \times (-5.56 m/s^2)$

$= -111,200N$

$\hookrightarrow -1.112 \times 10^5 N$

(1.4) Design Problem

Range = 60 ft

LA = 40

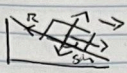
IV = 30

$$\frac{V_0^2 (\sin)(\theta)}{g}$$

$$\frac{40^2 (\sin(2(30))}{9.81}$$

(1.5) Design Problem

Unit 3.

① ⓐ  $\sum F = ma$

ⓑ $a = g(\sin\theta)$

② ⓐ $a = 9.81(\sin 10 - 1\cos 10)$

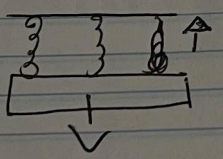
$9.81(.1736 - .0984)$

$.7369\ m/s$

ⓑ $.7369(30)$ $22.107\ m$

③

$X = \frac{my}{3k}$

④ ⓐ 

ⓑ $3(k)\Delta\vec{x} = \underline{\text{Spring} - W\vec{x}}$

ⓒ $\Delta\vec{x} = \frac{\vec{F}}{3(-0)}$ $\frac{\vec{6}}{3(-k)}$

⑤ ⓐ

⑥ $45 \times 10^9\ N\,m^{-2}$ $10000\ N$, $20cm$, $10m$

ⓐ

ⓑ

1.3

(a) $v^2 = u^2 + 2as$ $\quad s = \frac{v^2 - u^2}{2a}$

$s = \frac{(6.00\,m/s)^2 - (0\,m/s)^2}{2(.8)} = \boxed{22.5}$

(b) $v = u + at$ $\quad t = \frac{(v-u)}{a}$

$\frac{(6.00\,m/s - 0\,m/s)}{.8} = \boxed{7.5}$

1.2. (A) Answer Box Fig #1

P = 10,600
Q = 25, 21

600 − 338 = 262

105

P = t - 10
Q = t = 25

$\frac{600-338}{16-5} = \frac{262}{5} = 52.4$ m/s

$\frac{2138-1580}{25-20} = \frac{638}{5} = 127.6$ m/s

(B) Positive

1.3

Next Pge

Unit #1: Kinematics II & III

1.1 ① (a) **27 m/s**

$U = 15\ m/s \quad t = 4s$
$a = 3\ m/s$

$V = U + at$
$= 15 + 3 \times 4$
$= 15 + 12$
$= 27\ m/s$

(B) $S = ut + \frac{1}{2}at^2$
$= 15 \times 4 + (\frac{1}{2} \times 3 \times 4^2)$
$= 60 + 24$
$=$ **84 m**

(C) At $t = 0s$, IV = 15 m/s, Avg V = X

At $t = 4s$, IV = 27 m/s, Avg V = S/t $84/4 =$ **21 m/s**

At $t = 0$ the instantaneous velocity is 15 m/s & Avg is not determined. At $t = 4$ the instantaneous is

Steven Lora

Algebra-Based Physics #1 Midterm

Unit 0: Estimation, Unit Analysis, Vectors, & Kinematics

① $11.0\ g\ cm^{-3}$ [C]

② 10.0 hours [C] Speed = D/t 600km/60km/h

③ $90\ km\ hr^{-1}$ [D]

④ $1/6\ km\ hr^{-1}s^{-1}$ [C] $a = 10-0/60$ $a = \Delta V/\Delta t$

⑤ $5000\ m^2$ [A]

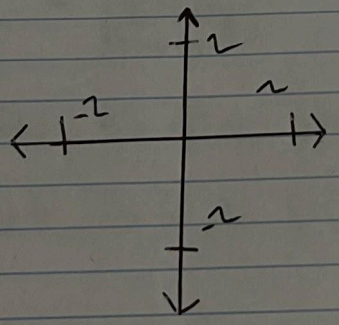
⑥ 4×10^4 [D]

⑦ -7.1 & -7.1 km/hr [D]

⑧ 225° [A]

⑨

ⓐ



[D]

ⓑ $\vec{V} + \vec{W} = (-2i+2j) + (2i-2i) = 0i+0i$

ⓒ $\vec{V} - \vec{W} = (-2i+2j) - (2i-2i) = \boxed{-4i+4j}$

ⓓ $\vec{V} + \vec{W} = 0$ $\vec{V} - \vec{W} = -4i+4j$ represen a vector that is extending $(-4, 4)$ on the cord plane

ⓔ $\vec{V} \cdot \vec{W} = (-2)(2) + (2)(-2)$

$-4-4 = \boxed{-8}$