Valeria Monserrat Arteaga Osorio N° lista : 6
Carnet : 00033524

1) d

2) d

3) b

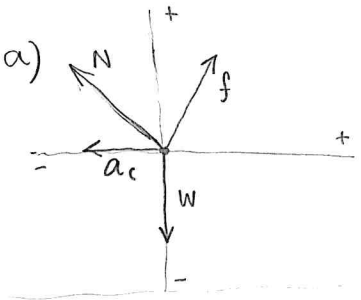
4) c

5) a

6) b

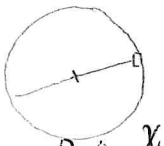
7) $m = 0.500\,kg$
$\beta = 30°$
$\mu_s = 0.200$
$h = 0.800m$

a)



b) $x(t) = x_i + v_0 t + \frac{1}{2}at^2$

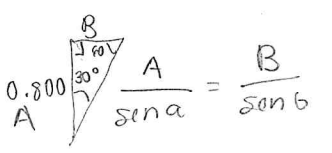
$x(t) = R + \frac{1}{2}\left(\frac{v^2}{R}\right)t^2$



$x(t) = R + \frac{v^2}{2R}t^2$

R// $x(t) = 0.46 + \frac{v^2}{2(0.46)}t^2$

Hallando R



$\frac{A}{sen\,a} = \frac{B}{sen\,b}$

$B = \frac{sen\,30°}{sen\,60°}(0.800)$

$B = 0.46m$

8) $m = 800\,Kg$
$x = 14m$
$v = 18\,m/s$

a) $W_{net} = K_f - K_i$

$W_{net} = \frac{1}{2}m(v_f^2 - v_i^2)$

$W_{net} = \frac{1}{2}(800)((18)^2 - 0^2)$

R// $W_{net} = 129600\,J/min$

c) $P = \frac{W}{t} = \frac{12600J(60s)}{1.16s}$

$= \frac{6703448.28W}{1000}$

$= 6703.45\,KW$

$y = y_0 + v_0 t + \frac{1}{2}at^2$

$14m = \frac{1}{2}at^2$

$a = vt = 18t$

$14 = \frac{1}{2}(18)(t)(t^2)$

$t = \sqrt[3]{\frac{2(14)}{18}} = 1.16s$

10) $t = 0$

$m = 2150\ Kg$

$F_x = At^2$

$781.25\ N \rightarrow t = 1.25\ s$

a) $781.25\ N = A\,(1.25\ s)^2$

$$A = \frac{781.25\ Kg\ m/s^2}{1.56\ s^2} = 500\ Kg \cdot m$$

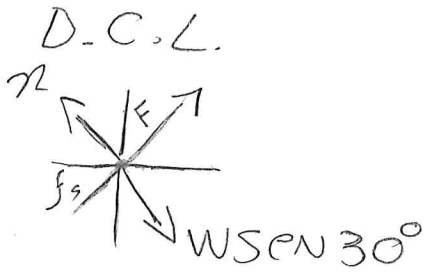
$$= 500\ J$$

Rodrigo Alejandro Campos Cierra 00167625 #8

1 - D 2 - B 5 - B 2 En el sistema A se toman los 3 ya que se incluye la tierra, mientras en el sistema B solo 1 y 2 ya que solo se toma en cuenta el resorte y la bola

3 - B 4 - B 6 - D

7. a)



B) $a_R = w^2 R$

$w = 2\pi f$

9. a) $V^2 = V_0^2 + 2a\Delta y$

$= V_0^2 + 2a(y_F - y_i)$

$V^2 = V_0^2 + 2g(y_F - y_i)$

$= 0 + 2(9.8)(3)$

$V^2 = 58.8$

$V = 7.66\ m/s$

b) $f_K = \mu_K n = \mu \cdot (m \cdot g)$

$= (0.250)(2 \cdot 9.8)$

$f_K = 4.9$

000125 25 n° 5

Aranda Guevara

Rosalina Janet

1. b a
2. d
3. b
4. a
5. d
6. a

9.

a) $V = ?$

$\vec{F} = m\vec{a}$

$= 2kg \cdot 9.8 m/s^2$

$= 19.6 N$

$\Delta x = \frac{1}{2} a t^2$ $\quad t^2 = \frac{\Delta x \cdot 2}{a}$

$t = 0.78 s$

$V = 3m / 0.78s$ $\quad V = 3.84 m/s$

b) $W_{fk} = ?$ $\quad F_R = N \mu_k$

$= 19.6 \times 0.250$

$= 4.9 N$

$N = m \times g$

$N = 19.6 N$ sen

$W = F_R L$

$W = 1.50m \times 4.9$

$W = 7.35 J$

c) $U_{EL} = \frac{1}{2} k x^2$ $\quad W_{neb} = \Delta U_g + \Delta U_{EL} + \Delta U_k$

we

$U_{EL} = \frac{1}{2} (400 N/m)$

(8) 800 kg por min

$h = 14\,m$

$v = 18\,m/s$

a) $W = \vec{F} \cdot \Delta x \quad \vec{F}$

$W =$ [illegible]

$W = 7,840\,N \times 14\,m$

$W = 109,760\,J$

[illegible] $W =$

a) $\vec{p} = m\vec{v}$

$\vec{J} = \Delta\vec{p}$

b) $W = \Delta K$

$W = \frac{1}{2} m v^2 \quad -0$

$W = \frac{1}{2}(800\,kg)(18\,m/s)^2$

$W = 129,600\,J$

c) $m\vec{v} = \vec{p}$

$\vec{p} = 800\,kg \times 18\,m/s$

$p = 14400\,w$

$p = 14.4\,kw$

¢) [illegible] $\Delta Ug = Ug_f - Ug_i$

d) $W_{neto} = \Delta Ug + \Delta K$

$= mg y_2 - Ug_{y_i}$ (0)

$= 800\,kg \times 9.8\,m/s^2 \times 14\,m$

$= 109760\,J + 129,600\,J$

$= 239,360\,J$

Se puede concluir que que es mayor el trabajo para elevar el agua contra gravedad

00012525

Aranda Guevara

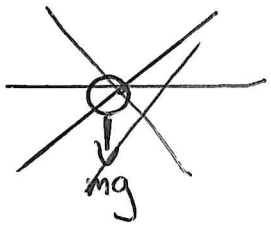
Rosalina Janet

7) $m = 0.5\,kg$

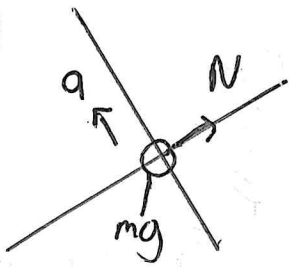
$\beta = 30°$

$\mu_s = 0.2$

$h = 0.800$



a)



b) $\Sigma F = ma$

$\Sigma F_y = -W + N\sin\theta$

$\Sigma F_y = -4.9\,N + 2.45\,N$

$= -2.45\,N = ma_R$

$\rightarrow +$ $\Sigma F_x = m\,a_R$

$f_x = 0.5\,kg \times \frac{v^2}{R}$

$mg\cos\theta + \mu_K mg\sin\theta$

$\Sigma F_x = N\sin\theta + f\cos\theta = m\frac{v^2}{R}$

$= mg\sin\theta + \mu mg\cos\theta = m\frac{v^2}{R}$

$= \frac{mv^2}{R}$

b) $\Sigma F_y = N\cos\theta - f\cdot\sin\theta - W = 0$

$= mg\cos\theta - \mu mg\sin\theta - mg$

$= 0.5\,kg \cdot 9.8\cos 30 - [0.2 \cdot 0.5\,kg\,g\sin 30] - 0.5\,kg \cdot 9.8$

$= -1.19\,N$

c) $v = \sqrt{R\,g\left|\frac{\tan\theta + \mu}{1 - \mu_s\tan\theta}\right.}$

$a = \alpha r$

$v = \sqrt{9.8\left|\frac{\tan 30 + 0.20}{1 - 0.20\tan 30}\right.}$

(10) $F_x = At^2$

$t = 0$

$m = 2,150\,kg$

$t = 1.125\,s$

a) $W = \int_0^{1.125} At^2$

f $t = 0$

b) $\int_{1.50}$

a)

a) $\vec{J} = \int \vec{F}\,dt$

$\frac{781.25\,N}{1.25\,s} = \int A t^2$

$625\,N/s$ • $\vec{F} = \frac{d\vec{p}}{dt}$ $\vec{F} = \frac{}{2t}$

$\int_0^{1.25} At^2 = 781.25\,N$

$A \int_0^{1.25} t^2 = 781.25\,N$

$A\,0.65 = 781.25\,N$

$A = \frac{781.25\,N}{0.65}$

$A = 1,200\,N$

B) ~~$\vec{J} = \Delta\vec{P}$~~

~~$J = m\vec{v}_f - m\vec{v}_0$~~

~~$J = 2,150\,kg$~~

$\vec{J} = \int F\,dt$

$\vec{J} = \int_{1.5}^{2} 1,200t^2$

$\vec{J} = \int_1^2 1,200t^2 = 1,850\,w$

c) $p_f = p_i + \vec{J}$

$m\vec{v}_f = m\vec{v}_i + J$

$v_f = 1,850$ +0

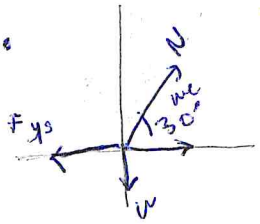
$v_f = 1,850$ m/s

00045625 Xochilt Valeria Flores Campos #16

1) a , 2) b, 3) d, 4) a , 5) d , 6) b

7)

a.



b. $\theta = 90°$

$\beta = 90° - 30.0° = 60.0°$

$\sum Fr = mac = mv^2 R = \frac{mv^2}{R^2}$

$N \sin(\theta) + fs \cos(\theta) = \frac{mv}{R}$

$\sum Fy = 0$

$N \cos(\theta) - fs \sin(\theta) - mg = 0 \Rightarrow N \cos(\theta)$

c.

$N \sin(60°) = 0.8660$

$\cos(60°) = 0.5$

$0.5 - (0.200)(0.866) = 0.500 - 0.1733 = 0.326$

$\frac{0.9660}{0.3267} = 2.956$

$V máx = \sqrt{(0.4619)(9.80)(2.956)} = 3.66 \text{ m/s}$

8)

a. $W gravedad = (800)(9.80)(14.0) = 109,760 J$

b. $W cinético = (400)(324) = 129,600 J$

d. La profundidad del pozo es de 14.0m, apesar de esa, debido la velocidad en la que sale expulsada. La energía cinética es mayor a la energía potencial. Obstante ambos son de una magnitud similar.

c. $W total = 109,760 + 129,600 = 239,36$

potencia $Kw = \frac{239,36}{60} = 3989.33 W$

$P Kw = \frac{3989.33}{1000} = 3,99 Kw$

9)

a. $V = \sqrt{2(9.80)(3.00)} = \sqrt{58,8}$

$= 7,66 \text{ m/s}$

b. 1) $Wf = -(0.250)(2.00)(9.80)(1.50) = -7.35 J$ fuerza fricción

2) $mgh = (2.00)(9.80)(3.00) = 58.8 J$

$58.8 - 7.35 = 51.45 J$ energía mecánica

c. $51.45 J = \frac{1}{2} K x^2 max$

$x max = \sqrt{\frac{2(51.45)}{400}} = \sqrt{0.257} = 0.506 m$

Fernanda María Aguilar Aguilar

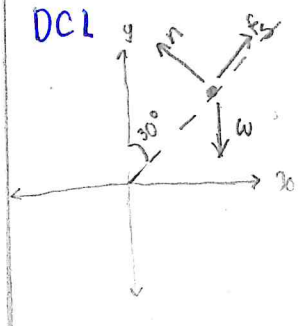
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No. Lista: 2

1) c, 2) b, 3) b, 4) b, 5) a, 6) c

7)

DCL



Ecu. de movimiento

$\sum F_y = n\cos(30°) + f_s\cos(30°) - w = 0$

$\sum F_x = f_s\,\text{sen}(30°) - n\,\text{sen}(30°) = ma$

8)

a) Trabajo en J para subir el agua?



Trabajo hacia arriba

$F = w$

$w = mg$

$W = Fd\cos(\theta)$

$W = (800\,kg)(9.80\,m/s^2)(14.0\,m)\cos(0°)$

$W = 109760\,J \approx 1.10 \times 10^5\,J$

$W = 1.10 \times 10^5\,J$

b) ¿Cuánto trabajo se efectuará para impartirle K_f?

$W = K_f - K_i^{\,0}$

$W = \frac{1}{2}mv^2$

$W = \frac{1}{2}(800\,kg)(18.0\,m/s)^2 \rightarrow W = 129600\,J$

$W = 129600\,J$

c) Comparación: Se requiere mucho más trabajo para acelerarla a su rapidez final, por lo tanto se consume más energía.

Ejercicio #9

a) Rapidez del bloque en el punto inferior de la rampa.

$$K_1^{0} + U_{g_1} = K_2 + U_{g_2}^{0}$$

$$mgh = \frac{1}{2}mv_2^2$$

$$2(mgh) = mv_2^2$$

$$v_2 = \sqrt{2gh}$$

$$v_2 = \sqrt{2(9.80 m/s^2)(3.00m)}$$

$$v_2 = 7.67 \ m/s$$

R/ = $V_2 = 7.67$ m/s

b) Trabajo realizado por la fuerza de fricción y energía mecánica

$$W_f = f_k d$$

$$W_f = (\mu_k \times n) d$$

$$W_f = (0.250 \times 19.6N)(1.50m)$$

$$W_f = 7.35 \ J$$

n = (2.00kg) x (9.80 m/s²)

n = 19.6 N

$$E = \frac{1}{2}mv^2 + \frac{1}{2}kx^2$$

$$E = \frac{1}{2}(2.00kg)(7.67m/s)^2 + \frac{1}{2}(400 N/m)(1.50)^2$$

$$E = 508.8 \ J$$

c) x_{max} =

Ejercicio #10

a) Valor de A

$$F_x = At^2$$

$$A = \frac{F}{t^2}$$

$$A = \frac{781.25N}{(1.25s)^2} \rightarrow A = 500 \ N/s^2$$

b) Impulso del motor sobre el cohete, $t_i = 1.50s$ y $t_f = 2.00s$

$$J = \int_{1.50}^{2.00} (At^2)\,dt$$

$$J = \frac{At^3}{3}\Big|_{1.50}^{2.00}$$

$$J = \left[\frac{(500 kg \cdot m)(2.00s)^3}{3}\right] - \left[\frac{(500 kg \cdot m)(1.50s)^3}{3}\right]$$

$$J = 771 \ kg \cdot m \cdot s^3$$

Walter Giovanni Flores Flores
00111925

lista: 14

1) C

2) B

3) B

4) a

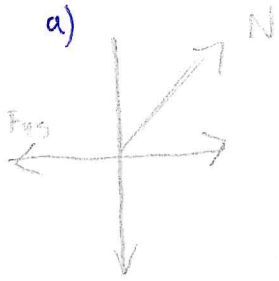
5) D

6) B

Walter Giovanni Flores Flores 00411925 (14) lista

7) ecuaciones de movimiento

a)



B) $Y// \; N\sin(30) - F_B\cos(30) - Mg = 30$

$X \quad N\cos(30) + F_B\sin(30) = M\frac{V^2}{r}$

c)

• Rapidez max

$r = h\tan(30) = 0.800(0.5777) = 0.462$

$MF_B = 0.200\,N$

$N(0.5 - 0.200 \times 0.866) = 0.500(9.8)$

$N(0.327) = 4.9 \;//\; \boxed{14.98\,N}$

$14.98(0.866 + 0.200 \times 0.5) = 0.500\,\frac{V^2}{0.462}$

$14.47 = 1.082\,V^2$

$\boxed{V = 3.66\,M/S}$

8) $W_g = Mgh = 800(9.8)(14.0)$

a) $\boxed{W_g = 109760\,J}$ $\quad 109.76\,KJ$

B) $W_K = \frac{1}{2}MV^2 = 0.5(800)(18.0)^2$

$\boxed{W_K = 129600\,J}$ $\quad \boxed{129.6\,KJ}$

C) $109760 + 129600 = 239360\,J$

$\frac{239360}{60} = 3,989.33\,W = \boxed{3.99\,Kw}$

$W_K > W_g$ → el trabajo necesario para acelerar el agua es mayor que el trabajo para elevarla.

9.

a) $Mgh = \frac{1}{2}MV^2$

$V = \sqrt{2gh} = \sqrt{2(9.80)(3.00)}$

$\boxed{V = 7.67\ M/S}$

B) $W_F = \mu_k M g L =$

$-0.250(2.00)(9.80)(1.50)$

$\boxed{W_F = -7.35\ J}$

$E_r = Mgh + W_F$

$2.00(9.80)(3.00) - 7.35 = 58.8 - 7.35$

$\boxed{E_r = 51.45\ J}$

C) $E_r = \frac{1}{2}KX^2_{max}$

$51.45 = 0.5(400)X^2_{max}$

$X_{max} = \sqrt{\frac{51.45}{200}} = \boxed{0.5071 \approx 0.51}$

$\boxed{0.5071}$

10) a) $AT^2 \rightarrow 781.25 = A(1.25)^2 \;//\; \frac{781.25}{1.5625} = \boxed{A = 500\ N/S^2}$

B) $\int_{2.00}^{3.50} 500T^2\,dT = \left.\frac{500T^3}{3}\right|_{2.00}^{3.50}$

$\boxed{J = 5812.5\ N \cdot S}$

C) $\Delta v = 5812.5 = 2150\,\Delta v$

$\Delta v = \frac{5812.5}{2150}$

$\boxed{\Delta v = 2.70\ M/S}$

Oscar Alberto Galicias Flores

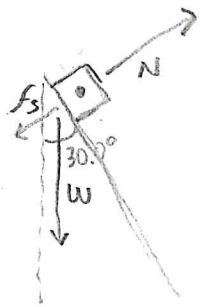
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N° de lista: 17

1) c 2) b 3) b 4) d 5) c 6) c

Ejercicios

(7) DCL



ECUACIONES DE MOVIMIENTO

$\Delta K = \frac{1}{2} m v^2$

$W_{TOTAL} = W_f + W_w + W_f + W_N$

$N = (m \cdot a) + w$

$N = (0.5 \cdot 12.73) + 4.9$

$N = 11.27\ N$

$a = w^2 R$

$a = (4.9)^2 (0.53)$

$a = 12.73\ m/s^2$

$W_f = (F \operatorname{Sen} \theta) \cdot d$

$W_w = (mg \cos \theta) \cdot d$

$W_f = -f \cdot d$

$W_{TOTAL} = 2.598) + (3.40) + (-1.8)$

$W_{TOTAL} = 4.148$

DATOS

$\beta = 30.0°$

$h = 0.800\ m$

$m = 0.500\ Kg$

$\mu_s = 0.200$

$R = 0.53 m$

$w = m \cdot g$

$w = (0.5)(9.8)$

$w = 4.9\ N$

$F = m \cdot a$

$F = (0.5)(12.73)$

$F = 6.375$

RAPIDEZ

$\frac{2\Delta K}{m} = v^2$

$V = \sqrt{\frac{2\Delta K}{m}}$

$V = \sqrt{\frac{2(4.148)}{0.5}}$

Rapidez $\boxed{V = 4.07\ m/s}$

---

(9) $\frac{1}{2} m v^2 = mgh$

$\frac{1}{2} v^2 = gh$

$v^2 = 2gh$

$v^2 = 2(9.8)(3)$

$V = \sqrt{58.8}$

$\boxed{V = 7.67\ m/s}$

Rapidez

$W_f = \mu_k \cdot N \cdot d$

$W_f = 0.25(19.6)(1.5)$

$\boxed{W_f = 7.35\ J}$ Trabajo

$U_{el} = \frac{1}{2} k x^2$

$51.45 = \frac{1}{2}(400) x^2$

$x^2 = \frac{2(51.45)}{400}$

$x^2 = 0.572 \Rightarrow \boxed{x = 0.51}$

Compresión máxima

$N = m \cdot g$

$N = 2(9.8)$

$N = 19.6\ N$

$E_i = mgh$

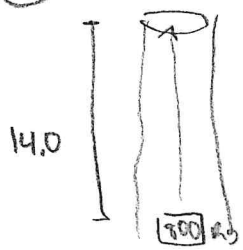
$E_i = 58.8\ J$

$E_i - W_f = 58.8 - 7.35$

$\boxed{E_{rest} = 51.45}$

Energía Residual

(8)



$V = 18\ m/s$

$t = 60s$

$m = 800\ kg$

$a = \frac{dv}{t}$

$V = \frac{\Delta x}{t}$

$V = \frac{14}{60}$

$18^2 = 2a(14)$

$\frac{18^2}{14} = 2a$

$23,14 = 2a$

$\frac{23,4}{2} = a$

$a = 11,7\ m/s^2$

$F = m \cdot \vec{a}$

$F = (800)(14.7)$

$F = 11760J$

$W = F \cdot \Delta x$

$W = 11760J \cdot 14$

$W = 1.65 \times 10^5\ J$

Trabajo

(10) $m = 2150\ kg$

$f(x) = At^2$



00051575
José Benito Castellón Mendoza N:20

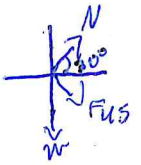
Parte 1 Opción multiple

1): C, 2): B, 3): B, 4): A, 5): D, 6): B

parte 2 Datos

Ej 7)

a.)



B) $\Sigma F_{(Y)}: (N/\sin B - F_S(\cos(B)) - mg = 0$

$\Sigma F_{(X)}: N \cdot (\cos(B) + \mu_S/\sin(B)) = m \cdot \frac{V^2}{R}$

c) $N = \frac{m \cdot g}{\sin(B) - \mu_S \cos(B)} = \frac{0.500 \cdot 9.8}{0.500 - (0.200 \cdot 0.8660)} = 14.994\ N$

$14.994\ (\cos(30) + \frac{0.200}{\cos(30)}) = 0.500\ \frac{V^2 max}{0.7679}$

$V max = \sqrt{13.38} = 3.66\ m/s$

Ej 8)

a) $W_g = m \cdot g \cdot h$

$W_g = 800\ kg \cdot (9.80\ m/s^2) \cdot 14\ m)$

$W_g = 109.76\ kJ$

B) $W_K = \frac{1}{2} m \cdot v^2$

$W_K = \frac{1}{2}\ 800\ kg\ (18\ m/s)^2$

$W_K = 129.6\ kJ$

c) $W_g + W_K = W\ total$

$W = total = 109.76\ kJ + 129.6\ kJ = 239.36\ kJ$

$P = \frac{W\ total}{T} = \frac{239.36\ kJ}{60\ s} = 3.99\ kW$

D) Se requiere mas energia para acelerar el cuerpo que para subirlo por lo tanto es importante analizar ambos procesos ninguno de los 2 calculos al tener magnitudes similares

Ej 9)

a) $E_{ma} = E_{mb}$

$m \cdot g \cdot h = \frac{1}{2} m v_1^2$

$v^2 = \sqrt{2 \cdot g \cdot h}$

$v^2 = \sqrt{2 \cdot 9.8\ m/s \cdot 3\ m} = 7.67\ m/s$

$F_K = \mu_K \cdot m \cdot g$

B) $W = -F_K \cdot L$

$W = -\mu_K \cdot m \cdot g \cdot L = (-250)(1\ kg) \cdot (9.8\ m/s^2) \cdot (2.50\ m) = -7.35\ J$

$E_g = m \cdot g \cdot h = 2\ kg \cdot 9.80\ m/s^2 \cdot 3\ m = 58.80\ J$

$E_2 = E_1 + W_{FK} = 58.80 - 7.35\ J = 51.45\ J$

Ej 9 continuación)

c) $E_2 = U_e = \frac{1}{2} k \cdot x^2_{max}$

$57.45\ J = \frac{1}{2} 400 \cdot x^2_{max}$

$57.45 = 200\ x^2_{max}$

$\sqrt{\frac{57.45}{200}} = x_{max}$

$x_{max} = 0.507\ m$

Ej 10)

a) $F_x = AT^2 \rightarrow A = \frac{F_x}{T^2} = \frac{787.25}{(1.25)^2} = 500\ N/s^2$, $F_x(t) = 500T^2$

b) $\Delta T = 1.50\ s$ $T_2 = (2+1.50)s = 3.50\ s$ $J_x = \int_{T_1}^{t_2} F_x(T)\,dT = \int_{2s}^{3.50s} 500T^2\,dT$

$J_x = \left[500 \cdot \frac{T^3}{3}\right]_2^{3.50} \rightarrow \frac{500}{3}(3.50^3 - 2^3) = \frac{500}{3} \cdot 34.875 = 5872.5\ N \cdot S$

c) $\Delta p_x = m \cdot \Delta v_x$

$J_x = m \cdot \Delta v_x$

$\Delta v_x = \frac{J_x}{m} = \frac{5872.5\ N \cdot m}{2150\ kg} = 2.70\ m/s$

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#03

1) d , 2) a , 3) d , 4) c , 5) c , 6) b

7.)

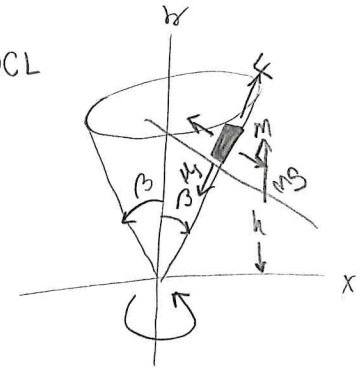
$m = 0.500 kg$

$\beta = 30.0°$

$\mu_s = 0.200$

$h = 0.800 m$

a) DCL



b) $n = mg$

$n = (0.500 kg)(9.8 m/s^2)$

$n = 4.9 N$

$h = \frac{V_0^2 \operatorname{sen}^2\theta}{2g}$

$0.800 = \frac{V_0^2 \operatorname{sen}^2(30°)}{2(9.8 m/s^2)} = V_0 = \frac{2h \operatorname{sen}\theta}{g}$

c) $V_0 = \frac{2(0.800)\operatorname{sen}(30°)}{9.8 m/s^2}$

$V_0 = 0.092$

$R = \frac{V_0^2 \operatorname{sen} 2\theta}{g}$

$R = 8.36 m/s$

8.)

$M = 800 kg$

$a = 18.0 m/s$

200 galones/m

a)

$n = mg$

$n = (800 kg)(9.8 m/s^2)$

$n = 7840 N$

$a = \mu_k \cdot g$

$\mu_k = \frac{a}{g}$

$\mu_k = \frac{18.0 m/s}{9.8 m/s^2}$

$\mu_k = 1.84$

$a = \mu_k \cdot g$

$a = (1.84)(9.8 m/s^2)$

$a = 18$

$F = ma$

$F = (800 kg)(18 m/s)$

$F = 14400 N$

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#05

9.)

$m = 2.00 kg$

$h = 3.00 m$

$L = 1.50 m$

$\mu_k = 0.250$

$k = 400 N/m$

$g = 9.8 m/s^2$

$v_0 = 0 m/s$

a)

$a = \mu_k g$

$a = 2.45 N$

$F = ma$

$F = (2.00 kg)(2.45 N)$

$\vec{F} = 4.9 N$

$n = mg$

$n = (2.00 kg)(9.8 m/s^2)$

$n = 19.6 N$

$f_k = (0.250)(19.6 N)$

$f_k = 4.9$

$a = (400 N/m)(9.8 m/s)$

$a = 3920 m/s$

b) $f_k = (0.250)(19.6 N)$

$f_k = 4.9$

$W_f = F \cdot d_x$

$W = (4.9 N)(1.50 m)$

$W = 7.35 J$