00106724

Joseline Esmeralda Pérez Funes.

1	C
2	B
3	B
4	A
5	D
6	D

7) a) $r = h \tan\beta$

$r = (80)\tan(30)^\circ$

$r = 0.462\ m$

$N\cos\beta - \sin\beta = m\cdot w^2 r$

$N\sin\beta + f\cos\beta = mg$

$f = \pm \mu_s N$

b) $w^2_{min} = \frac{g(\cos\beta - \mu_s \sin\beta)}{r(\sin\beta + \mu_s \cos\beta)}$

$w_{min} = \sqrt{\frac{9.8\ m/s^2 \cdot \cos(30^\circ) - 0.200\cdot\sin(30)}{0.462 \cdot (\sin(30)+0.200\cdot\cos 30)}}$

$w_{min} = 4.91\ rad/s$

$w_{max} = 7.92\ rad/s$

8) a) $W_g = mgh$

$W_g = (800)(9.8\ m/s^2)(14)$

$W_g = 109760\ J$

b) $W_K = \Delta K$

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

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

$W_K = 129,600\ J$

c) $P = \frac{W\ total}{t}$

$W\ total = W_g + W_K$

$W_{total} = 109,760J + 129,600J$

$W_{total} = 239,360\ J$

$P = \frac{239,360\ J}{60}$

$P = 3989.33\ w$

$P = 3.99\ w$

$W_g = 109,760J$

$W_K = 129,600J$

$W_K > W_g$

00106724 Joseline Esmeralda Pérez Fomes

9) $m = 2.00\ kg$
$h = 3.00\ m$
$L = 1.50\ m$
$\mu_k = 0.250$
$k = 400\ N/m$
$g = 9.8\ m/s^2$

a) $v = \sqrt{2gh}$

$v = \sqrt{2(9.80)(3.00)}$

$v = 7.66$

$v = 7.67\ m/s$

b) $W_f = -\mu_k mgL$

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

$W_f = -7.35\ J$

c) $E_{res} = mgh + W_f$

$E_{res} = (2.00)(9.8\ m/s)(3.00) + -7.35\ J$

$E_{res} = 51.45\ J$

$x_{max} = \sqrt{\frac{2E_{reg}}{k}}$

$x_{max} \sqrt{\frac{2(51.45)}{400}}$

$x_{max} = 0.507\ m$

10) a) $F_x = At^2$

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

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

$A = 500\ N/s^2$

b) $J = \frac{A}{3}\left[\frac{t^3}{3}\right]_{t_i}^{t_f}$

$J = \frac{500}{3}[(3.50)^3 - (2.00)^3]$

$J = \frac{500}{3}[42.875 - 8.000]$

$J = 5812.5\ N \cdot s$

c) $\Delta v = \frac{J}{m}$

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

$\Delta v = 2.70\ m/s$

00042424 Anderson Farid Gálvez Maldonado

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

7) $M = 0.500\ kg$ $N = 0.200$
$B = 30.0°$ $h = 0.800\ m$

$\tan\theta = 0.800$ $\tan\theta = 30.00$
$\theta = 9.905$ $= 0.4662$ (1)

b) $N \sin\theta + F \cos\theta = Mg$
$N \cos\theta + F \sin\theta = mw^2$
$F \leq U$ $N = 0.200\ V$

8)

a) $W_p = (800)(9.80)(14.0) = 1.0976 \times 10^5\ J/min$

b) $W_k = \frac{1}{2}(800)(18.0)^2 = 1.296 \times 10^5\ J/min$

c) $W_{total} = 1.0976 \times 10^5 + 1.296 \times 10^5 = 2.39360 \times 10^5\ J/min$

$\frac{W_E}{E} = \frac{2.39360 \times 10^5}{60} = 3.99\ kW$

d) La energía de salida es mayor que la energía necesaria para elevar el agua, por eso no se puede despreciar la rapidez de salida

00042424 Anderson Farid Galvez Maldonado

9)

a) $(2.00)(9.80)(3.00) =$

$v = \sqrt{2(9.80)(3.00)} = \sqrt{58.8} = 7.67$ m/s

b) $W_f = -(0.250)(2.00)(9.80)(1.50)$

$W_f = -7.35$ J

$58.8 - 7.35 = 51.45$ J ← energía mecánica

$v = \sqrt{\frac{2(51.45)}{2.00}} = \sqrt{51.45}$

$v = 7.17$ m/s

c) $\sqrt{\frac{2(51.45)}{400}} = 0.507$ cm

50.7 m

10)

a) $F = A\epsilon^2$

$A = \frac{781.25}{(1.25)^2} = 500$

Valor SI $= 500$ N/S

b) $\epsilon_1 = 2.00$ s y $\epsilon_2 = 2.00 + 1.50 = 3.50$

$J = \int_{2.00}^{3.50} A\epsilon^2 \, d\epsilon = \frac{A}{3}(3.50^3 - 2.00^3)$

$J = \frac{500}{3}(42.875 - 8) = 5812.5$

Impulso $J = 5.812 \times 10^3$ N·S en +X

c) 2150 m

$v = \frac{J}{m} = \frac{5812.5}{2150} = 2.7035$

$v = 2.70$, cambio $v = 2.70$ m/s

00207723 Josué Edgardo Vasquez Landaverde

1) d

2) a

3) b

4) C

5) d

6) b

Ejercicio (7)

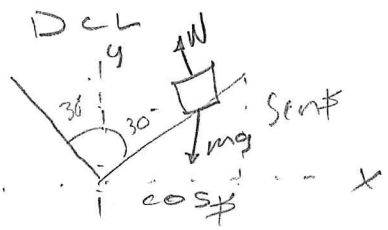
Datos:

$\mu_{Bloq} = 0.500$ kg

$\beta = 30°$

$\mu_s = 0.200$

$h = 0.800$ m



$r = 0.100 \times \tan 30°$

$= 0.469$ m

$\sin 30° = 0.5$

$\cos 30° = 0.8$

Ecuacion 1

$\sum F_y = N\sin\beta - \mu_s\cos\beta - mg = 0$

$N(\sin\beta - \mu_s\cos\beta) = mg$

$N = \frac{mg}{\sin\beta - \mu_s\cos\beta}$

$N = \frac{mg}{\sin\beta - \mu_s\cos\beta}$

Ecuacion 2

$N(\cos\beta + \mu_s\sin\beta) = m\frac{v^2_{max}}{r}$

$N(\cos\beta + \mu_s\sin\beta) = m\frac{v^2_{max}}{r}$

Rapidos maximos

$\frac{\cos\beta + \mu_s\sin\beta}{\sin\beta - \mu_s\cos\beta} = \frac{v^2_{max}}{g \cdot r}$

$v_{max} = \sqrt{g \cdot r\left(\frac{\cos\beta + \mu_s\sin\beta}{\sin\beta - \mu_s\cos\beta}\right)}$

$v_{max} = \sqrt{9.8(0.200)\left(\frac{0.8 + 0.200(0.5)}{0.5 - 0.200(0.8)}\right)}$

$v_{max} = 3.66$ m/s

$v_{max} = 3.66$ m/s

00207723 Josué Edgardo Vasquez Landaverde

Ejercicio (8)

Trabajo para elevar el agua

$W_g = m \cdot g \cdot h = 800kg \times 9.8 m/s^2 \times 14m$

$W_g = 109,760J$ / $= 109.760J$

Trabajo para Impartir energía cinética

$W_K = \frac{1}{2} mv^2 = \frac{1}{2} \times 800kg \times (18.0m/s)^2$

$W_K = 129,600J$ / $= 129,600J$

Potencia para su bomba:

$W_{total} = W_g + W_K = 109,760J + 129,600J$

$W_{total} = 239,360J$

$P = \frac{W_{Total}}{t} = \frac{239,360J}{60s} = 3,989.3W$ //

$= 3,989.3W$

00207723 José Eduardo Vasquez Landaverde

Ejercicio (9)

a) rapidez al pie de la rampa:

$\mathcal{E}_A = \mathcal{E}_i \Rightarrow mgh$

$v_i = \sqrt{2gh}$

$v_1 = \sqrt{2(9.8 m/s^2)(3m)}$

$v_1 = 7.67 m/s$ / $= \underline{7.67 m/s}$

Trabajo de fricción

$N = mg = 2kg \times 9.8 m/s^2$

$N = 19.6N$ / $= \underline{19.6N}$

$f_R = \mu_k N = 0.250 \times 19.6N$

$= 4.90 N$ / $= \underline{4.90N}$

$W_f = -f_R \cdot L = -4.90N \times 1.5m$

$= -7.35 J$ / $= \underline{-7.35J}$

Energía cinética residual

$\mathcal{E}_1 = mgh = 2kg \times 9.8 m/s^2 \times 3m$

$\mathcal{E}_1 = 58.8J$ / / $= \underline{58.8J}$

$\mathcal{E}_2 = \mathcal{E}_1 + W_f$

$\mathcal{E}_2 = 58.8J + (-7.35J)$

$\mathcal{E}_2 = 51.45J$ / / $= \underline{51.45J}$

00128023 Juan Carlos Romero Delgado

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

(7) $m = 0.5\,kg$; $\beta = 30°$ con la vertical ; $\mu_s = 0.2$; $h = 0.8m$

$w = 4.9$

7.a) DCL



7.b) $\sum f_y = n - w\cos\beta = 0 \rightarrow n = w\cos\beta$

$n = 4.9\cos 30°$

$n = 4.24$

7.c) $V_{max} = ?$

$mgh = \frac{1}{2}mv^2 \rightarrow v^2 = 2gh \rightarrow v^2 = 2(9.8)(0.8)$

$v^2 = 15.68 \Rightarrow v = 3.96\,m/s$

$V \approx 4\,m/s$ ~~4 m/s~~

(8) $m = 800kg \equiv 210$ galones ; $h = 14m$; $V = 18m/s$

$800\frac{kg}{min} \equiv 210\frac{gal}{min}$ $\quad 18\frac{m}{s}\cdot\frac{1\,min}{60s} = 0.3\frac{m}{s^2} = a$

8.a) $W = ?$

$W = f\Delta y \rightarrow W = fh$; $f = ma \rightarrow f = 800(0.3)$

$f = 240N$

$W = (240)(14)$

$W = 2800\,J$

8.b) $K = ?$

$K = \frac{1}{2}mv^2 \rightarrow K = \frac{1}{2}(800)(18)^2 \rightarrow K = 129{,}600$

8.c) $P = ?$

$P = mv$

$P = (800)(18)$

$P = 14400\,N$ $\quad P = 144kN$

00128023 Juan Carlos Romero Delgado

(9) $m = 2\,kg$; $h = 3\,m$; $L = 1.5\,m$; $\mu_k = 0.25$; $k = 400\,\frac{N}{m}$;
$n = w = 19.6$; $g = 9.8\,m/s^2$

9.a) $V = ?$

$K = \frac{1}{2} m v^2 \rightarrow 400 = \frac{1}{2}(2) v^2 \rightarrow v^2 = 400$ $\quad V = 20\,m/s$

9.b) $f_k = ?$;

$f_k = \mu_k n \rightarrow f_k = (0.25)(19.6) = 4.9\,N$

9.c) $x_{max} = ?$

$U_{el} = \frac{1}{2} k x_{max}^2 = f_k \rightarrow \frac{1}{2}(400)\, x_{max}^2 = 4.9\,N \rightarrow x_{max}^2 = \frac{4.9}{200}$

$x_{max} = 0.15\,m$



(10) $m = 2150\,kg$; ec: $f_x = At^2 = 781.25\,N \; (t = 1.25\,s)$

10.a) $A = ?$

$781.25 = A(1.25)^2 \rightarrow 781.25 = 1.56\,A$

$A = 500.80$

10.b) Impulso $= ?$

$\vec{J} = \Delta P \rightarrow 2003.2 - 1126.8 = 876.4$

$P_i = (500.80)(1.5)^2$; $P_f = (500.80)(2)^2$

$P_i = 1126.8$ $\quad P_f = 2003.2$

10.c) $\Delta V = ?$

$P = m \Delta V$

$876.4 = 2150 \Delta V$

$\Delta V = 0.40\,m/s$

00164123 Juan Pablo Recinos Morena

1. c)

2. b)

3. b)

4. c)

5. d)

6. b)

7. b) Vertical:

$$N\sin\beta - \mu_s N\cos\beta - mg = 0$$

Radial:

$$N\cos\beta + \mu_s N\sin\beta = \frac{mv^2}{r}$$

c) Radio:

$$r = h\tan\beta = 0.800\tan 30$$

$$r = 0.4619\,m$$

Normal:

$$N = \frac{mg}{\sin\beta - \mu_s\cos\beta} = \frac{(0.500)(9.8)}{0.5 - 0.2(0.8660)}$$

$$N = 15\,N$$

$$v^2 = gr\frac{\cos\beta + \mu_s\sin\beta}{\sin\beta - \mu_s\cos\beta}$$

$$= (9.8)(0.419)\left(\frac{0.9660}{0.3268}\right)$$

$$v^2 = 12.14$$

$$v_{máx} = 3.5\,m/s$$

00164123 Juan Pablo Recinos Moreno

8. a) $W_{subir} = mgh\ (800)(9.8)(14) = 109760\ J$

$\boxed{W_{subir} = 109760\ J}$

b) $K = \frac{1}{2}mv^2 = \frac{1}{2}(800)(18)^2 = 129600\ J$

$\boxed{K = 129600\ J}$

c) $W_{TOTAL} = 109760 + 129600 = 239360\ J$

$\boxed{W_{TOTAL} = 239360\ J}$

d) $\frac{K}{W_{subir}} = \frac{129600}{109760} = 1.18$

La energía para dar velocidad es mayor que la de elevar el agua, así que ninguno de los procesos se puede despreciar.

9. a) $mgh = \frac{1}{2}mv^2$

$v = \sqrt{2gh} = \sqrt{2(9.8)(3)} = 7.67 m/s$ $\boxed{V = 7.67 m/s}$

b) $W_f = -\mu_k mgL = -(0.250)(2)(9.8)(1.5) = -7.35\ J$ $\boxed{W_f = -7.35\ J}$

$E_B = mgh = 2(9.8)(3) = 58.8 J$ $E_B = 58.8\ J$

$E_C = 58.8 - 7.35 = 51.45\ J$ $\boxed{E_C = 51.45\ J}$

c) $\frac{1}{2}kx_{máx}^2 = 51.45 \rightarrow x^2 = \frac{2(51.45)}{400} = 0.1573$

$x_{máx} = 0.507$ $\boxed{X_{máx} = 0.507\ m}$

00164123 Juan Pablo Recinos Moreno

10. a) $F_x = At^2$

$$A = \frac{F_x}{t^2} = \frac{781.25}{(1.25)^2} = \frac{781.25}{1.5625} = 500\ N/s^2$$

$\boxed{A = 500\ N/s^2}$

b) $$J = \int_{2.00}^{3.50} At^2\,dt = \frac{A}{3}\left[t^3\right]_{2.00}^{3.50}$$

$$J = \frac{500}{3}\left[42.875 - 8.000\right]$$

$$J = 5812.5\ N_s$$ $\boxed{J = 5812.5\ N_s}$

c) $m\Delta v$

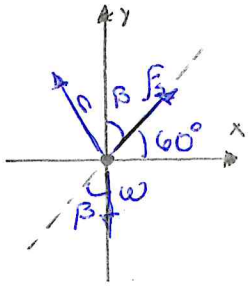
$$\Delta v = \frac{J}{m} = \frac{5812.5}{2150} = 2.70\ m/s \text{ en } +x$$

$\boxed{\Delta v = 2.70\ m/s \text{ en } +x}$

Mauricio Xavier Henriquez Ventura 00162725

1. D
2. A
3. D
4. B
5. D
6. B

7. a) DCL



b) $\vec{F}_{C_x} = m\,a_c$ $\quad a_c = \frac{V^2}{R}$ $\quad \vec{F}_{C_y} = m\,a_c$

~~$0.5(9.8) = 0.5\,a_c$~~

~~$a_c = 9.8$~~

~~0.5~~

$F_{C_x} = m\,a_c$

c) $0.5\,(9.8)\,\text{Sen}(30) \Rightarrow 0.5\,(9.8)(0.20) = 0.5\,a_c$

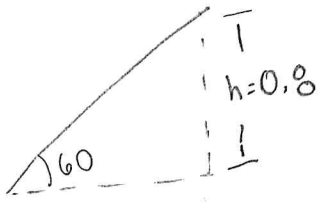
$\Rightarrow -0.5(9.8)\,\text{Sen}(30) + 0.5(9.8(0.70)\cos(60) = 0.5\,a_c$

$a_c = 3.92$

$a_c = \frac{V^2}{R}$

$3.92 = \frac{V^2}{0.416}$

$V = 1.34\ m/s$



$\tan\theta = \frac{\text{Sen}}{\cos} = \frac{OP}{ad}$

$Ad = \frac{OP}{\tan\theta}$

$R = \frac{0.8}{\tan 60} = 0.416$

8. c) $P = m\,V$

$P = (800)(18)$

$P = 14400\ W$

$P = 14.4\ KW$

Mauricio Xavier Henriquez Ventura 00162728

10.

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

$A = 500\ \frac{N}{s^2}$ -> $A = 500\ J$

b) $I = F\,\Delta t$

$I = 781.25\,(t_f - t_i)$

$I = 781.25\,(3.25_s - 1.25_s)$

$I = 1757.81\ N$

c) $I = \Delta p$

$I = p_f - p_i$

$I = m\,(v_f - v_i)$ ($v_i = 0$)

$I = m\,v_f$

$1757.81 = 2150\ kg\ v_f$

$v_f = 0.82\ m/s$

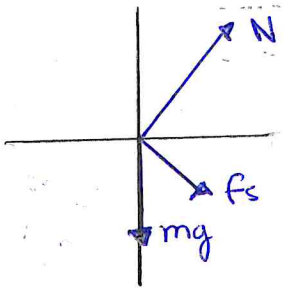
9.

$W = \Delta K + \Delta U_g + \Delta U_{el} + \Delta U_{int}$

#00173824 Jorge Adalberto Rodas Climaco #56

①	a
②	b
③	b
④	a
⑤	b
⑥	c

⑦a)



b) $m = 0.500\ Kg$ $\beta = 30°$ $\mu_s = 0.200$ $h = 0.800\ m$

$g = 9.81\ m/s^2$

$\tan\beta = \frac{r}{h}$ $r = 0.800\ m \tan 30°$ $r = 0.4618\ m$

$N\sin\beta - f_s\cos\beta\, mg = 0$ $N\cos\beta - f_s\sin\beta = \frac{mv^2}{r}$ $f_s = \mu_s N$

$N\cos + f_s\sin\beta = mg$ $N(\cos\beta + \sin\beta) = mg$ $N = \frac{mg}{\sin\beta - \mu_s\cos\beta}$

$$N = \frac{(0.500)(9.81)}{\sin 30° - (0.200)\cos 30°} = \boxed{N = 15\ N}$$

c) $N\cos\beta + f_s\sin\beta = \frac{mv^2}{r}$ $f_s = \mu_s N$

$N\cos\beta + \mu_s N\sin\beta = \frac{mv^2}{r}$

$$V = \frac{\sqrt{rN(\cos\beta + \mu_s\sin\beta)}}{m} \qquad V = \frac{\sqrt{0.4618(15)(\cos 30° + (0.200)\sin 30°}}{0.500}$$

$V = 3.66\ m/s$ $\boxed{V = 3.66\ M/S}$

⑧ Datos

$m = 800\ Kg/min$

$h = 14m$

$v = 18.0\ m/s$

$g = 9.81\ m/s$

a) $W_g = mgh$

$W_g = (800)(9.81)(14)$

$W_g = 109872\ J/min$

$\boxed{W_g = 109872\ J/min}$

b) $W_c = \Delta K = \frac{1}{2}mv^2$

$W_c = \frac{1}{2}(800)(18.0)^2$

$W_c = 129600\ J/min$

$\boxed{W_c = 129600\ J/min}$

c) $W_T = W_g + W_c$

$W_T = 109872 + 129600$

$W_T = 239360\ J/min$

$P = \frac{W_T}{\Delta T}$

$P = \frac{239360}{60} = 3989.33W$

$P = 3.99KW$

$\boxed{P = 3.99KW}$

d) $\frac{W_c}{W_g} = \frac{129600}{109760}$

$\boxed{\frac{W_c}{W_g} = 1.18}$

#00173824 Jorge Adelberto Rodas Climaco #56

(a) $m = 2.00\,Kg$
$h = 3.00\,m$
$L = 1.50\,m$
$\mu_K = 0.250$
$K = 400\,N/m$
$g = 9.81\,m/s^2$

b) $N = mg$

$N = (2.00)(9.81) = 19.6\,m$

$f_K = \mu_K N$

$f_K = (0.250)(19.6)$

$f_K = 4.90\,N$

$E_f = E_i + W_f$

$E_f = 58.8 - 7.35$

$E_f = 51.45\,J$

$\boxed{E_f = 51.45\,J}$

a) $K_i + U_i = K_f + U_f$

$0 + mgh = \frac{1}{2}mv^2 + 0$

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

$v = \sqrt{2gh}$

$V = \sqrt{2(9.81)(3)}$

$V = 7.67\,m/s$

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

$W_f = -(490)(1.50)$

$W_f = -7.35\,J$

$E_i = mgh$

$E_i = (2)(9.81)(3) = 58.8\,J$

(c) $E_f = \frac{1}{2}Kx^2_{max}$

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

$51.45 = 200x^2_{max}$

$x_{max} = \sqrt{\frac{51.45}{200}}$

$x_{max} = 0.507\,m$

$\boxed{x_{max} = 0.507\,m}$

(10) Datos

$m = 2150\ kg$

$f_x = At^2$

a) $f_x = At^2$

$A = \frac{f_x}{t^2}$ $\quad A = \frac{781.25}{(1.25)^2}$ $\quad A = 500\ kg/s^4$

$\boxed{A = 500\ kg/s^4}$

b) $t_i = 2.00\ s$

$t_f = 2.00 + 1.50 = 3.50\ s$

$J = \int_{t_i}^{t_f} f_x\, dt$ $\quad J = \int_2^{3.5} 500t^2\, dt$ $\quad J = \int_2^{3.5} \frac{500t^3}{3}$

$J = \frac{500t^3}{3}\Big|_2^{3.5}$ $\quad J = \frac{500}{3}(3.5)^3 - 2^3$ $\quad J = 5812.5\ N.s$

$\boxed{J = 5812.5\ N.s}$

c) $J = \Delta p = m\Delta v$

$\Delta v = \frac{J}{m}$ $\quad \Delta v = \frac{5812.5}{2150}$ $\quad \Delta v = 2.70\ \frac{m}{s}$

$\boxed{\Delta v = 2.70\ \frac{m}{s}}$

00152324 Joseph Jogadoc Rodriguez Vega

1. C
2. B
3. B
4. A
5. D
6. B

7. Datos

bloque $m = 0.500\,kg$

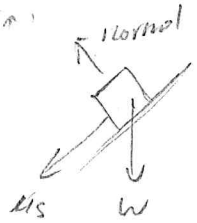
$\beta = 30.0°$

$\mu_s = 0.200$

$h = 0.800\,m$



a) bloque



b) Ecuaciones de movimiento

$\sum F_r = m\omega^2 r$

$N\sin\beta + \mu_s \cos\beta = m\omega^2 r$

$N(\sin\beta + \mu_s \cos\beta) = m\omega^2 r$

$r = h \tan\beta$

$r = 0.800 \tan 30°$

$r = 0.4619\,m$

$f_s = \mu_s N$

$\sum F_y = 0$

$N\cos\beta - f_s \sin\beta - mg = 0$

$N(\cos\beta - \mu_s \sin\beta) = mg$

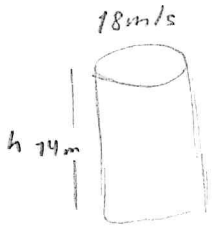
c) Rapidez máxima

$$\omega_{max} = \sqrt{\frac{g(\sin\beta + \mu_s\cos\beta}{r(\cos\beta + \mu_s \sin\beta)}} \rightarrow \omega_{max} = \sqrt{\frac{9.8(\sin 30° + 0.2\cos 30°)}{0.4619(\cos 30° + (0.2)\sin 30°)}}$$

$\omega_{max} = 4.32\ \frac{rad}{s}$

8. Datos

800 kg agua (210 galones)



a) ¿Cuanto trabajo en J se efectuara por minuto para subir el agua?

$W_g = mgh \rightarrow 800(9.8)(14) = 109760\,J$

b) ¿Cuanto trabajo se efectuará para impartirle la energia cinetica que tiene al salir?

$W_c = \frac{1}{2} m v^2$ $\quad W_c = 129600\,J$

$W_c = \frac{1}{2}(800)(18)^2 = 129600\,J$

c) ¿Que potencia en kw desarrolla la bomba?

$W_T = W_g + W_c$

$W_T = 109760 + 129600$

$W_T = 239360\,J$

$P = \frac{W_T}{t} \rightarrow P = \frac{239360\,J}{60}$

$P = 3.99\,kw$

$P = 3.99\,kw$

d) comparación y conclusión $W_c > W_g$

la energia cinetica al salir es mayor al trabajo por minuto al subir el agua

9)

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9) datos

bloque
$m = 2\,kg$
$h = 3\,m$
$L = 1.50\,m$



$\mu K = 0.250$ $g = 9.8\,m/s^2$
$K = 400\,N/m$

a) rapidez

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

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

$$v_B = \sqrt{2(9.80)(3.00}$$

$$v_B = 7.67\,m/s$$

$$v_B = 7.67\,m/s$$

b) trabajo

$$W_F = -\mu K\, m\, g\, L$$

$$W_F = -(0.250)(2)(9.8)(1.50) = -7.35\,J$$

c) compresión maxima que sufre el resorte cuando el bloque se detiene.

x_{max}

$$E = mgh + W_F \rightarrow E = (2)(9.80)(30) - 7.35 \quad E = 51.45\,J$$

$$E = \frac{1}{2}Kx_{max}^2 \qquad 51.45 = \frac{1}{4}(400)x^2$$

$$x_{max} = \sqrt{\frac{2(51.45)}{400}} \qquad x_{max} = 0.507\,m \qquad x_{max} = 0.507\,m$$

10) Datos

$m = 2150\,kg$ $F(1.25) = 781.25\,N$

$F_x = At^4$

a) constante A

$$781.25 = A(125)^4$$

$$A = \frac{781.25}{(1.25)^4}$$

$$A = 320\,N/s^4$$

$$A = 320\,N/s^4$$

b) impulso

$$J = \int_2^{3.50} Ft\,dt$$

$$J = \int_2^{3.50} 320t^4\,dt = J = 31565.0\,Ns$$

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

7)



$w = m\,g$

$w = (0.500)(9.8\ m/s^2)$

$w = 4.9N$

$N = (0.500\ kg)(9.8\ m/s^2)\ sen(30)$

$N = 2.45N$

$F_s = \mu_s \cdot N$

$F_s = (0.200)(2.45)$

$F_s = 0.49N$

$\Sigma F_y = ma$

$4.9N - 2.45N = 0.500\ kg \cdot a$

$\frac{2.45N}{0.500\ kg} = a$

$4.9\ m/s^2 = a$

$V^2 = V_0^2 + 2a\Delta x$

$V = \sqrt{2(4.9\ m/s^2)(0.800\ m)}$

$V = 2.8\ m/s$

9) $\Sigma m_A = \Sigma m_f$

$m \cdot g \cdot h = \frac{1}{2} m V_1^2$

$V_1 = \sqrt{2 \cdot g\, h}$

$V_1 = \sqrt{2(9.8\ m/s^2)(3\ m)}$

$V_1 = 7.67\ m/s$

$E_2 = 58.80J - 7.35J$

$E_2 = 51.45J$

$E_2 = \mu_K = \frac{1}{2} K x^2 max$

$51.45 = 200 \cdot x^2 max$

$\sqrt{\frac{51.45}{200}} = x max \rightarrow 0.507m = x^2 max$

$W = -f_K \cdot L \longrightarrow (-250)(2\ kg) \rightarrow W = -7.35J$

$F_K = \mu_K \cdot N \rightarrow \mu_K (mg)$

$E_1 = (2\ kg)(9.8\ m/s^2)(3\ m)$

$E_1 = 58.80J$

10) $m = 2150 kg$ $F_x(t) = At^2$ $f_x(1.25) = 781.25$

$F_x = At^2$

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

$A = \frac{781.25}{(1.25)^2}$

$A = 500 N/s^2$

$F_x(t) = 500 t^2$

$\Delta t = 1.50$

$J_x = \int_{t_1}^{t^2} F_x(t)\,dt =$

$J_x = \int_2^{3.50} 500 t^2\,dt$

$J_x = \left[500 \frac{t^3}{3}\right]_2^{3.50}$

$J_x = \frac{500}{3}\left(3.50^3 - 2^3\right)$

$J_x = \frac{500}{3} \times 34.875$

$J_x = 5812.5 N/s$

$\Delta_{px} = m \cdot \Delta V_x$

$J_x = m \cdot \Delta V_x$

$\Delta V_x = \frac{J_x}{m}$

$\Delta V_x = \frac{5812.5 N/s}{2150 Kg}$

$\Delta V_x = 2.70 m/s$

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1-C 2-b 3-b 4-d 5-d 6-b

(7)

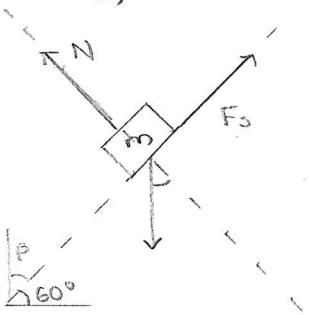
$m = 0.5\ kg$

$\beta = 30.0°$

$\mu_s = 0.2$

$h = 0.8\ m$

a)



b)

$\sum F_y = 0 \quad \uparrow +$

$N - 4.9\cos 60 = 0$

$N = 2.45\ N$

$\sum F_x = ma \quad +\nearrow$

$F_s - 4.9 \operatorname{sen} 60 = -0.5\,a$

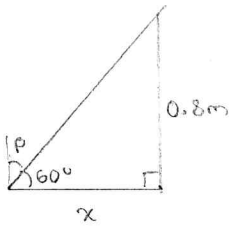
c)

$F_{max} = 0.2\,(2.45)$

$= 0.49\ N$

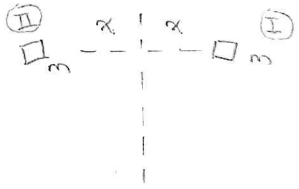
$0.49 - 4.9 \operatorname{sen} 60 = -0.5\,a$

$a = 7.5\ m/s^2$



$\tan(60°) = \frac{0.8}{x}$

$x = 0.4619\ m$



$0.49(0.9238) + 4.9 \operatorname{sen} 60 (0.9238) + \frac{1}{2}(0.5)v^2 = 0$

$v = 4.18\ m/s$

(8)

$18\ m/s \cdot \frac{60\ s}{1\ min} = 1080\ m/min$

800 Kg

(9) $m = 2\,Kg$

$h = 3m$

$L = 1.5m$

$\mu_K = 0.25$

$K = 400\,N/m$

$g = 9.8$

a) $2(9.8)(3) = \frac{1}{2}(2)v^2$

$v = 7.67\,m/s$

b) $F_{fricción} = 0.25(19.6)$

$= 4.9\,N$

$W_{fric} = 4.9(1.5) = -7.35\,J$

$-4.9(1.5) + \frac{1}{2}(2)(7.67)^2 = \frac{1}{2}(2)v_f^2$

$v_f = 7.17\,m/s$

$\frac{1}{2}(2)(7.67)^2 - res = \frac{1}{2}(2)(7.17)^2$

$res = 7.42\,J$

c) $\frac{1}{2}(2)(7.17)^2 = \frac{1}{2}(400)\Delta x_{max}$

$x_{max} = 0.26\,m$

(10)

$t = 0$

$m = 2150\,Kg$

$F_x = At^2$

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

$A = 500\,N/s^2$

b) $F = 500(3.5)^2$

$= 6125\,N$

$F = 500(2)^2$

$= 2000\,N$

$J = (6125 - 2000)(1.5)$

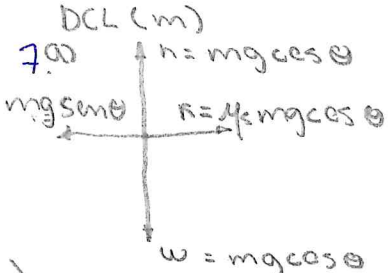
$J = 6185.5\,N \cdot s$

c)

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

7. a) DCL (m)



$$\sum F_y = m \cdot \frac{V^2}{R}$$

$$n - mg\cos\theta = \frac{mV^2}{R}$$

$$g\sin\theta + \mu_s g\cos\theta = \frac{V^2}{R}$$

$$V = \sqrt{R(g\sin\theta + \mu_s g\cos\theta)}$$

b)



entonces siguiendose este teorema se encuentra el angulo de inclinación con respecto a h $\theta = 60°$

$W_{nc} = \Delta K + \Delta U_{grav}$

$W_{nc} = \mu_s mg\cos\theta$

$\Delta K = K_f^{\,0} - K_i$

$\Delta K = -\frac{1}{2}mv^2$

$\Delta U_{grav} = mgd\sin\theta$

$\mu_s mg\cos\theta = -\frac{1}{2}mv^2 + mgd\sin\theta$

8.

9.

dados

$m = 2\,kg$

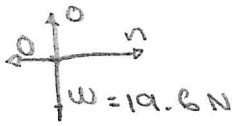
$h = 3\,m$

$L = 1.5\,m$

$\mu_k = 0.25$

$K = 400\ \frac{N}{m}$

DCL (mien A



a) $F = m \cdot a$

$= 19.6\ N$

$W = F \Delta x$

$= 16.9\ N \cdot 3\,m$

$= 50.7\ J$

10.

a) $F_x = A t^2$

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

$A = \frac{791.25\ N}{(1.25\,s)^2}$

$A = 500\ \frac{N}{s^2}$