00030524 Andrea Letizia Olmedo Barillas

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

7. Datos

$m = 0.5\,kg$

$\beta = 30°$

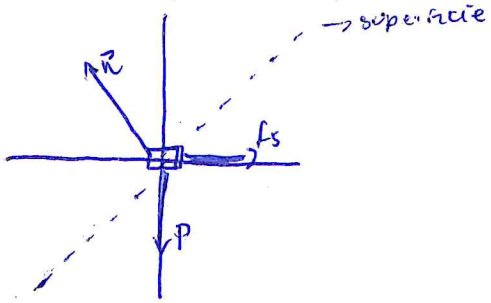
$\mu_s = 0.2$

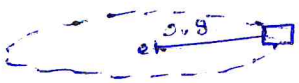
$h = 0.8$

$P = (0.5)(9.8) = 4.9\,N$

$v_{max} = ?$

a) DCL





b) Para v_{max} $\quad f_{s_{max}} = \mu_s n$

$f_s = (0.2)n$

$\Sigma F = m \cdot a_{rad}$

$-P + n = m \cdot \frac{v^2}{Rg}$

$-4.9 + n = 0.5 \frac{v^2}{0.8(9.8)}$

$-4.9 + n = \frac{0.5 v^2}{7.84}$

$\frac{(-4.9 + n)\,7.84}{0.5} = v^2$

8) $W = F \cdot \Delta r$

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

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

$K = 129{,}600$

$F = -kx$

$F = -129{,}600\ (14)$

$F = -1{,}814{,}400\ N$

$W = F \cdot \Delta r$

$W = 1814400\ N(14)$

$W = 25401600\ J$

00015425 Liliana Victoria Hernández Vásquez.

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

⑧ 800kg → 2100g/min
h = 14.0m
V = 18.0m/s

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

$K = 129600 J/min$

⑨ m = 2.00kg
h = 3.00m
L = 1.50m
$\mu_k = 0.250$
k = 400 N/m
$g = 9.80 m/s^2$

a)
$V^2 = V_0^2 + 2a\Delta x$
$V^2 = 0 + 2a(3.00)$
$\Sigma F_y = ma$

b) Trabajo de la fricción
$f_k = \mu_k N$
$\Sigma F_y = ma$
$\Sigma F_y = N - w$
$N - w = ma$
$N - 19.6 = 0$
$N = 19.6 N$

$f_k = (0.250)(19.6)$
$f_k = 4.90 N$
$W = (4.90)(1.50)$
$W = 6.75 J$

c) $U_{el} = \frac{1}{2}kx^2$
$= \frac{1}{2}(400)$
$= 200 J$

Carnet: 00093223 Nombre: Camilo Membreño Hernández.

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

7) $m = 0.500kg$

$\beta = 30°$

$\mu_s = 0.200$

$h = 800$

$\sin 30 = 0.5$

$\cos(30) = 0.866$

$\tan(30) = 0.577$

$Y = 0.800 \cdot 0.577 = 0.4619m$

- $N = \dfrac{9.8 \times 0.500}{0.866 - 0.200(0.5)} = 6.397N$

- $f_s = 0.200(6.397)$

  $f_s = 1.279N$

- $6.397(0.5) + 1.279(0.866) = 1.0825\, v^2max$

  $\downarrow$

  $3.1985 + 1.1075 = 1.0825\, v^2max$

  $v^2max = 3.978$

  $v max = \sqrt{3.978} = \boxed{V max = 1.99 m/s}$

8) a) $W_g = \Delta U = mgh = (800)(9.8)(14) = 109760J$

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

c) $P = \dfrac{W\ Total}{\Delta\ total}$

$W_T = 109760J + 129600J = 239360J$

$\Delta t = 60s$

$P = \dfrac{239360}{60} = 3989.33W = \boxed{3.989kW}$

d) el trabajo para impartir la fuerza Cinetica de 129600j es ligeramente mayor que el trabajo necesario para elevar el agua con gravedad de 109760j.

9) a) Rapidez $mgh = \frac{1}{2}mv^2 \Rightarrow v = \sqrt{2gh} \Rightarrow v = \sqrt{2(9.8)(3.00)}$

$v = 7.6681 \, m/s$

b) $W_f = -f_k \cdot L = -(\mu_k m g)L$

$W_f = -(0.250)(2)(9.8)(1.5) = -7.35 \, J$

c) $mgh + W_f = \frac{1}{2}k(\Delta x)^2$

$2(9.8)(1.5) + (-7.35) = \frac{400(\Delta x)^2}{2}$

$\sqrt{\frac{58.8 - 7.35}{200}} = \Delta x$

$0.5071 \, cm = \Delta x$

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

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

b) $\int_{2.00}^{3.50} f(t)\,dt$

$J = \int_{2.00}^{3.50} 320t \, dt \quad j = \frac{320t^5}{5} \Big|_{2.00}^{3.50}$

$J = 64(3.50)^5 - (200)^5]$

$J = 64(525.2187.5) - 32$

$J = 31565.0 \, Ns$

c) $J = m\Delta v$

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

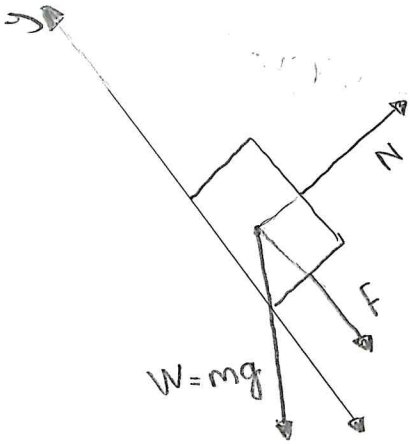
$\Delta v = \frac{31565}{2150} = 14.7 \, m/s$

00081024 Nataly Rosmery Rodríguez Fuentes

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

7)

a) DCL



b) Datos:

$m = 0.500\,kg$

$\beta = 30.0°$

$\mu = 0.200$

$h = 0.800\,m$

$g = 9.80\,m/s^2$

$r = h\tan\beta = 0.800\tan(30.0°)$

$r = 0.462\,m$

$\sum F_x = m a_c : N\cos\beta + F\operatorname{sen}\beta = \frac{mv^2}{r}$

$\sum F_y = 0 \quad N\operatorname{sen}\beta - F\cos\beta - mg = 0$

$F = \mu_s N$

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

$$N = \frac{(0.500)(9.80)}{\operatorname{sen}(30.0°) - (0.200)\cos(30.0°)}$$

$N = 15.0\,N$ //.

$f = (0.200)(15.0) = 3.00N$

$f = 3.00N$ //.

c) $V = \sqrt{\frac{rN(\cos\theta + \mu_s \operatorname{sen}\theta)}{m}}$

$V = \sqrt{\frac{(0.462)(15.0)(\cos(30.0°) + 0.200\operatorname{sen}(30.0°))}{0.500}}$

$V_{máx} = 3.66 m/s$ //.

8) Datos:

$m = 800kg$

$h = 14.0m$

$V = 18.0m/s$

$t = 60s$

$g = 9.80m/s^2$

a) $W_g = mgh = (800)(9.80)(14.0)$

$W_g = 109,760 J$ //.

b) $W_K = \frac{1}{2}mV^2$

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

$W_K = 129600J$ //.

c) $P = \frac{W_g + W_K}{t} = \frac{109,760 + 129,600}{60} = \frac{239.360}{60}$

$P = 3.99 KW$ //.

d) $\frac{W_g}{W_{total}} = \frac{109.760}{239.360} = 45.9\%$ //. $\frac{W_K}{W_{total}} = \frac{129.600}{239.360} = 54.1\%$ //.

Subir el agua requiere de 109.760J y acelerarla 129.600J, los dos procesos pesan casi lo mismo, igual en la energía total, los dos no se pueden ignorar.

00081024 Nataly Rosmery Rodríguez Fuentes.

9) Datos:

$m = 2.00 kg$

$h = 3.00 m$

$L = 1.50 m$

$\mu_K = 0.250$

$K = 400 N/m$

$g = 9.80 m/s^2$

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

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

$v = 7.67 m/s$ //.

b) $W_F = -\mu_K mgL$

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

$W_F = -7.35 J$ //.

$E_i = mgh = (2.00)(9.80)(3.00)$

$E_i = 58.8 J$

$E_{res} = E_i + W_F = 58.8 - 7.35$

$E_{res} = 51.5 J$ //.

c) $\frac{1}{2} K \cdot X_{máx}^2 = E_{res}$

$X_{máx} = \sqrt{\frac{2E_{res}}{K}} = \sqrt{\frac{2(51.45)}{400}}$

$X_{máx} = 0.507 m$ //.

10) $m = 2150\,kg$ $t = 1.25$ magnitud $= 781.25N$

$$F_x = At^2$$

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

$$A = 500N/s^2 //.$$

b) Interva 2.00 s a 3.50 s

$$J = \int_{2.00}^{3.50} 500t^2 dt = 500\,\frac{t^3}{3}.2.00^{3.50}$$

$$J = \frac{500}{3}(3.50^3 - 2.00^3) = \frac{500}{3}(42.875 - 8.00)$$

$$J = 5.81 \times 10^3 N.S0 \quad J = 5.812.5 N.S //.$$

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

$$\Delta V = \frac{J}{m} = \frac{5.81 \times 10^3}{2150}$$

$$\Delta V = 2.70\,m/s$$

00037525 Isis Marla López Cruz

1. a

2. b

3. b

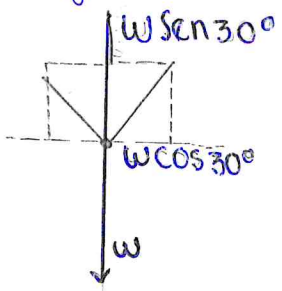
4. b

5. d

6. C

7. Datos: $m = 0.500\ kg$
$\beta = 30.0°$
$\mu_s = 0.200$
$h = 0.800\ m$

Diagrama:



$w = (0.500\ kg)(9.80\ m/s^2)$

$w = 4.9\ N$

Ecuaciones:

$\sum F_x = w\ Cos\ 30°$

Rapidez maxima:

$V^2 = 2gL(Sin\theta - \mu_s Cos\theta)$

$V^2 = (2(9.80)(0.800))(Sin\ 30° - 0.200 \times Cos\ 30°)$

$V^2 = (15.68)(0.3268)$

$V = 2.26\ m/s$

00037525 Isis Marla López Cruz

10.

a) $781.25 = A(1.25)^2$

$781.25 = A\ 1.5625$

$\frac{781.25}{1.5625} = A$

$500\ kg/m = A$

b) $\Delta t = t_f - t_i = 0.50$

$F = (500)(0.50)^2$

$F = 125\ N$

00014624 Xavier Ernesto García Villacorta

1) a

2) b

3) d

4) b

5) d

6) d

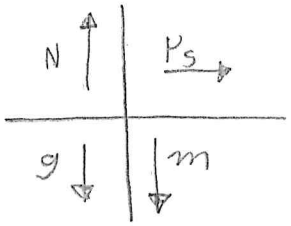
7) Datos

$m = 0.500\ kg$

$\theta = 30.0°$

$\mu_s = 0.200$

$h = 0.800\ m$



$N = (0.500\ kg)(9.8)\cos 30°$

$N = 4.2435$

$f_s = (0.200)(4.2435)$

$f_s = 0.8487$

$U_g = mgh$

$(0.500)(9.8)(0.800)$

$U_g = 3.92$

$mgh - f_s = \frac{1}{2} m v^2$

$3.92 - 0.8487 = \frac{1}{2}(0.500) v^2$

$3.0913 = 0.250\, v^2$

$\frac{3.0913}{0.250} = v^2$

$12.3652 = v^2$

$V = 3.51\ m/s$

8) Datos

$m = 800\ kg$

$h_1 = 0\ m$

$h_f = 14\ m$

$V = 18\ m/s$

trabajo para subir el agua

109,760 J

$W_{gravedad} = -(mgh_f - mgh_i)$

$((800)(9.8)(14) - (800)(9.8)(0))$

$-109760\ J$

$-109760 = \frac{1}{2}(800)(18)^2$

$-109760 = 400(324)$

$-109760 = 129600$

$= 129600 + 109760$

$W_{total} = 239360$

trabajo para impartirle energia

129,600 J

Potencia en kW

239.36 kW

Se puede concluir que el trabajo de energia es mas grande que el de subirle sin velocidad

9) Datos

$m = 2\ kg$

$h = 3$

$\mu_K = 0.250$

$K = 400$

$g = 9.8$

$L = 1.50$

$V = \sqrt{2 \cdot g \cdot h}$

$V = 7.66\ m/s$

$N = mg$

$N = (2)(9.8)$

$N = 19.6$

$F_K = (0.250)(19.6)$

$f_K = 4.9$

$W_f = -f_K \cdot d \cdot \cos\theta$

$W_f = -4.9(1.50)(-1)$

$W_f = 7.35$

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

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

$= 200x^2$

$\frac{1}{2} m v - W_f$

$\frac{1}{2}(2)(7.66) + 7.35$

$x_{cm} = (2)x_1 + (2$

$W_{neto} = 15.01 = 200x^2$

$\frac{15.01}{200} = x^2 \quad x = 0.273$

00007025 José Manuel Ochoa Rivas

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

7. $\sum F_y = 0$

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

$\sum F = ma$

$N \cos\beta + F_s \sin\beta = m v^2 / r$

$F_s = \mu_s N$

$r = h \cdot \tan\beta$

c)

$r = h \cdot \tan\beta$

$= 0.800 \cdot \tan 30$

$= 0.46188\ m$

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

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

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

$N = \dfrac{0.500 \cdot 9.80}{\sin 30^\circ - 0.200 \cos 30^\circ}$

$N = 14.994\ N$

$f_s = \mu_s N$

$= 0.200 \cdot 14.994$

$= 2.999\ N$

$N \cos\beta + F_s \sin\beta = \dfrac{m v^2}{r}$

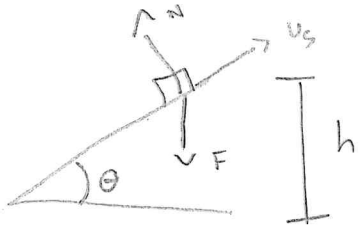
$14.994 \cos 30 + 2.999 \sin 30 = \dfrac{0.500 v^2}{0.46188}$

$14.4848 = \dfrac{0.500 v^2}{0.46188}$

$\sqrt{v^2} = \sqrt{\dfrac{14.4848 \cdot 0.46188}{0.500}}$

$v_{max} = 3.66\ m/s$

Diagrama:



00007025 José Manuel Ochoa Rivas

8. Datos:

800 kg = m

14.0 = Distancia

18.0 m/s = rapidez

a) $W = mgh$

$= (800)(9.8)(14.0)$

$W_1 = 109.760\ J/min$

b) $W = \Delta K$

$W = 1/2\ mv^2$

$= 1/2\ (800)(15)^2$

$W_2 = 129.600\ J/min$

c) $W_F = W_1 + W_2$

$= 109.760 + 129.600$

$W_F = 239.360\ J$

$P = W_F / t$

$P = \frac{239.360}{60} = 3989.33$

Después

$P = \frac{3989.33}{1000} = 5.99\ kW$

D) $W_1 = 109.760$

$W_2 = 129.600$

$\Delta W = 129.600 - 109.760$

$= 19.460\ J$

$W_2 / W_1 = 1.18$

9. Datos:

m = 2.00 kg

h = 3.00 m

L = 1.50 m

$\mu_K = 0.250$

k = 400 N/m

$g = 9.80\ m/s^2$

$E_i = mg$

$= 2 \cdot 9.80 \cdot 3$

$= 58.80\ J$

$E_F = 58.80 - 7.35$

$= 51.45$

$E_i = E_F$ a)

$mgh = 1/2\ mv^2$

$gh = 1/2\ v^2$

$v = \sqrt{2gh}$

$v = 7.67$

B) $mg = N$

$N = 2(9.80)$

$N = 19.60\ N$

$F_K = \mu_K N$

$= 0.250 \cdot 19.60\ N$

$F_K = 4.90\ N$

$W_F = -FcL$

$(-4.90)(1.50)$

$W_F = -7.35\ J$

c) $E_F = Ucl$

$= 1/2\ kx^2$

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

$x = \sqrt{\frac{51.45}{200}}$

$x = 0.5071$