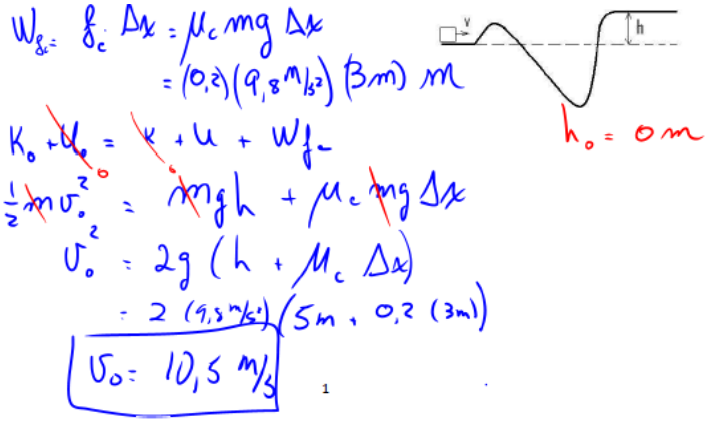
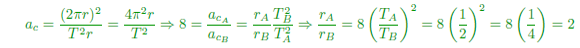
Version C

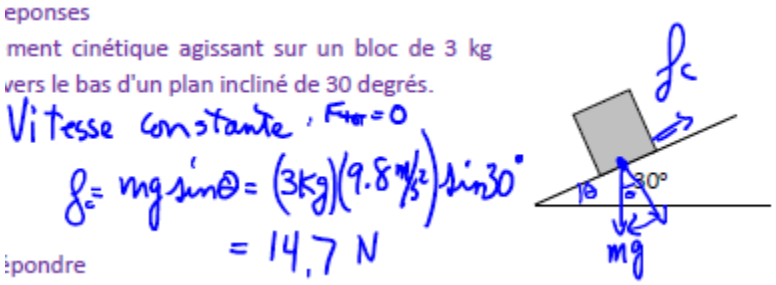
1. C
2. D



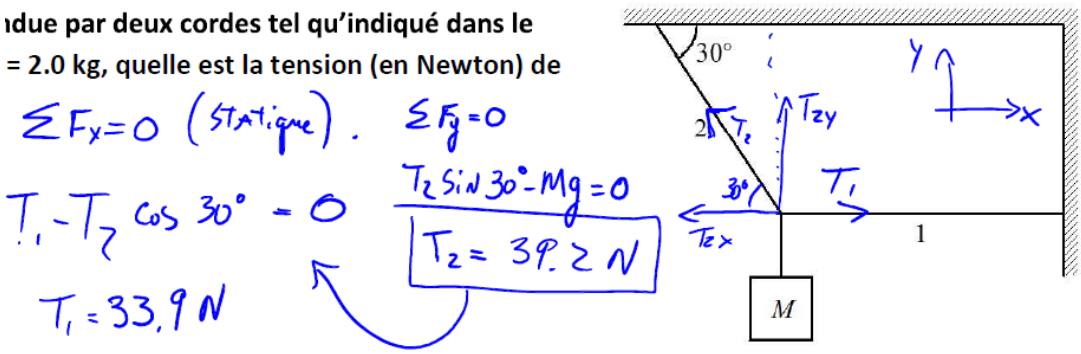
3. C (Vitesse initiale + aire sous la courbe = 10+16+8)
4. E



5. C



6. E



7. D
8. B

$v_y^2 = v_{y_0}^2 + 2a\Delta y$ ↑y

$= 0 + 2(-9.8\ m/s^2)(-10\ m)$

$v_y = 14\ m/s$

9. D

$v_y^2 = v_{oy}^2 + 2g\Delta y$

$0 = (15\ m/s)^2 + 2(-9.8\ m/s^2)\Delta y$

$\Delta y = 11,5\ m$

onses

10. A

Poids $= m(9,8 - 2)\ m/s^2$

$= 54,6\ N$

11.

a) $N = 0$ à la vitesse minimum. (5)

b) $\Sigma F_y = -mg - N = -ma_c$ (4)

$g = a_c = \frac{v^2}{R}$ (3)

$v = \sqrt{Rg} = \sqrt{(16m)(9.8\ m/s^2)}$

$v = 12,5\ m/s$ (1)

c) $\Delta E = 0 = \Delta K + \Delta U$ (4)

$K_i + U_i = K_f + U_f$

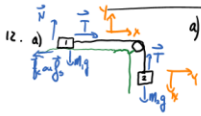
$0 + mgh_1 = \frac{1}{2}mv^2 + mg(2R)$ (h_2) (3)

$h = \frac{\frac{1}{2}v^2 + 2gR}{g} = \frac{\frac{1}{2}(12,5\ m/s)^2 + 2(9,8\ m/s^2)(16m)}{9.8\ m/s^2}$

$h = 40,0\ m$

12.

12. a)



a) $\Sigma F_{1x} : T - f_s = m_1 a = 0$ ($a = 0$ juste avant la Bougie)

① $T = f_s = \mu_s N = \mu_s m_1 g$

$\Sigma F_{1y} : N - m_1 g = 0$

$N = m_1 g$ (5)

$\Sigma F_{2x} = m_2 g - T = 0$

② $T = m_2 g$

⇒ ② dans ①

$T = \mu_s m_1 g$

$m_2 g = \mu_s m_1 g$ (2)

$m_2 = \mu_s m_1 = (0,25)(3\,kg) = 0,75\,kg$

b) $a_1 = a_2 = a$

$\Sigma F_{1x} = T - f_c = m_1 a$ (5)

③ $T - \mu_c m_1 g = m_1 a$

$\Sigma F_{2x} = m_2 g - T = m_2 a$ ④

③ + ④ ⇒ $m_2 g - \mu_c m_1 g = (m_1 + m_2) a$ (2)

$$a = \frac{m_2 g - \mu_c m_1 g}{m_1 + m_2}$$

$$= \frac{(8\,kg)(9,8\,m/s^2) - (0,1)(3\,kg)(9,8\,m/s^2)}{(3\,kg + 8\,kg)}$$

$a = 6,86\,m/s^2$

c) $v_x^2 = v_{0x}^2 + 2 a_1 \Delta x$ (4)

$v_x = \sqrt{0 + 2(6,86\,m/s^2)(0,8\,m)}$ (3)

$v_x \simeq 3,31\,m/s$