GLOBAL

1:

Madrid ——— 98 km. Segovia

V	20 km/h	49 km/h	98 km/h
t	4,9 h	2 h	1 h

a)

Al aumentar V disminuye t, luego son inversamente proporcionales.

$t = \frac{k}{k}$ ⇒ tanto que calcular k

$4{,}9\,h = \frac{k}{20\,km/h} \Rightarrow k = 4{,}9\,h \cdot 20\,km/h = 98\,km$

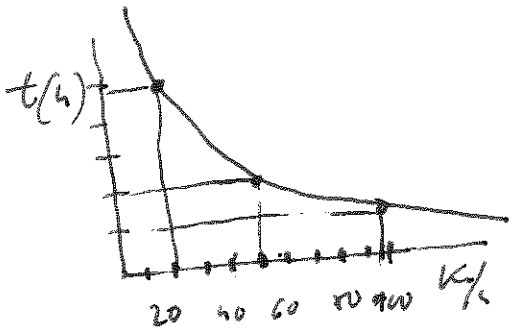
$2\,h = \frac{k}{49\,km/h} \Rightarrow k = 2\,h \cdot 49\,km/h = 98\,km$

$1\,h = \frac{k}{98\,km/h} \Rightarrow k = 1\,h \cdot 98\,km/h = 98\,km$

Como podemos comprobar

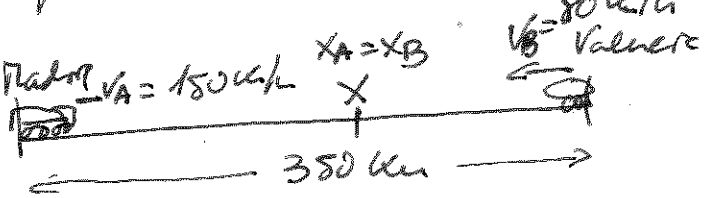
$t = \frac{98\,km/h}{V}$

b)



c) El tiempo (t) y la velocidad (v) son inversamente proporcionales

2: a)



c)

$x_A = V_A \cdot t$

$x_B = 380\,km - V_B \cdot t$

$x_A = x_B$

$V_A t = 350\,km - V_B \cdot t$

$V_A t + V_B t = 350\,km$

$(V_A + V_B)\,t = 350\,km$

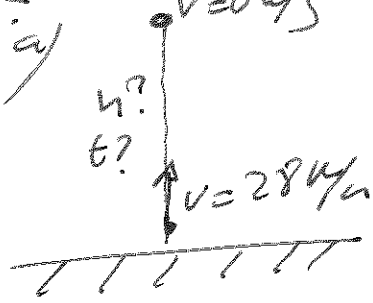
$$t = \frac{350\,km}{v_A + v_B} = \frac{350\,km}{150\,km/h + 80\,km/h} = \frac{350\,km}{230\,km/h} = 1{,}52\,h.$$

b)

$$x_A = v_A \cdot t = 150\,km/h \cdot 1{,}52\,h = 228\,km.$$

Se encuentra a 228 km de Madrid.

3 - a)



c) En el punto más alto, altura máxima, la velocidad $\rightarrow 0\,m/s$

$$v_f = v_0 - gt$$

$$0\,m/s = 7{,}78\,m/s - 9{,}8\,m/s\,t$$

$$9{,}8\,m/s\,t = 7{,}78\,m/s$$

$$t = \frac{7{,}78\,m/s}{9{,}8\,m/s} = \boxed{0{,}79\,s}$$

b)

$$x = x_0 + v_0 t - \frac{1}{2} g t^2$$

$$x = 7{,}78\,m/s \cdot 0{,}79\,s - \frac{1}{2} 9{,}8\,m/s^2 (0{,}79\,s)^2 = \boxed{3{,}1\,m}$$

d) Hemos de calcular a la mitad

$$v_f = v_0 - gt$$

$$\frac{1}{2} v_0 = v_0 - gt$$

$$gt = v_0 - \frac{1}{2} v_0$$

$$gt = \frac{1}{2} v_0$$

$$t = \frac{v_0}{2g} = \frac{7{,}78\,m/s}{2 \cdot 9{,}8\,m/s} = \boxed{0{,}397\,s}$$

4:

a) $v = 108\ km/h = 30\ m/s$

$\vec{F}$ $a = 1{,}8\ m/s^2$

b) $v_f = v_0 + at$

$120\ km/h = 33{,}3\ m/s$

$33{,}3\ m/s = 30\ m/s + 1{,}8\ m/s^2 \cdot t$

$33{,}3\ m/s - 30\ m/s = 1{,}8\ m/s^2 \cdot t$

$3{,}33\ m/s = 1{,}8\ m/s^2 \cdot t$

$t = \frac{3{,}33\ m/s}{1{,}8\ m/s^2} = 1{,}85\ s$

c) $x = x_0 + v_0 t + \frac{1}{2} a t^2$

$x = 30\ m/s \cdot 1{,}85\ s + \frac{1}{2} 1{,}8 \cdot (1{,}85\ s)^2 = 58{,}6\ m$

d) $v_f = 0\ m/s$

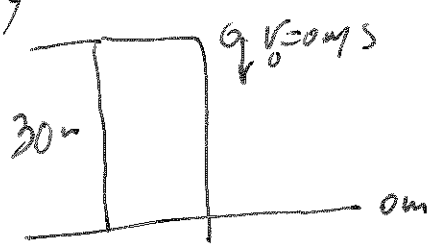
$v_f = v_0 + at$

$0\ m/s = 33{,}3\ m/s + a \cdot 10\ s$

$-33{,}3\ m/s = 10a\ s$

$a = \frac{-33{,}3}{10}\ m/s^2 = -3{,}33\ m/s^2$

5) a)



b) $x = x_0 + v_0 t - \frac{1}{2} g t^2$

$0\ m = 30\ m - \frac{1}{2} 9{,}8\ m/s^2 \cdot t^2$

$30\ m = 4{,}9\ m/s^2 \cdot t^2$

$t^2 = \frac{30\ m}{4{,}9\ m/s^2} = 6{,}12\ s^2$

$t = \sqrt{6{,}12\ s^2} = 2{,}47\ s$

c) $v_f = v_0 - gt$

$v_f = 0\,m/s - 9{,}8\,m/s^2 \cdot 2{,}47\,s = -24{,}2\,m/s$

d) $x = x_0 + v_0 t - \frac{1}{2} g t^2$

$x = 30\,m - \frac{1}{2} 9{,}8\,m/s^2 \cdot (1{,}2)^2 = 22{,}9\,m$

6)

a) $5.456\,m = 5{,}5\,m$

b) $49{,}34\,cm = 49\,cm$

c) $389.700\,km = 390.000\,km$

d) $6{,}9 + 13{,}55 + 3{,}754 = 24{,}204 = 24$

e) $54.300 \times 33{,}6 = 1.824.480 = 1.800.000$