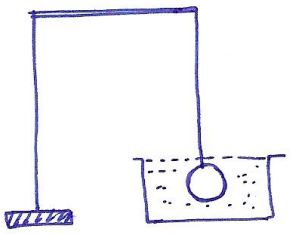
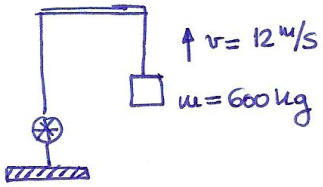
Energia. Potentzia. Energia

① 

Ondoko izudian agertzen den bezala, esfera bat uretan murgildu da. Esferaren erradioa 0'5 m-koa da eta materialaren deutsitatea 5.600 kg/m³ -koa da. Kalkulatu:

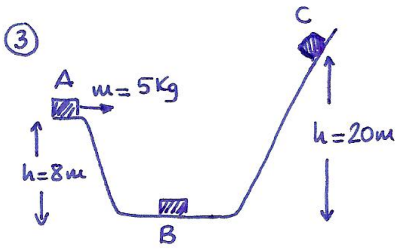
a) Esferaren pisua (P)
b) Bultzadaren (E) balioa
c) Esferaren itxurazko pisua (P_i)
d) Soka askatuz gero, flotatuko duen ala ez.

② 

Garabi batek 600kg-ko karga igotzen du 12 m/s-ko abiaduraz. Kalkulatu:

a) garabiaren potentzia (W)
b) garabiaren potentzia (ZP)

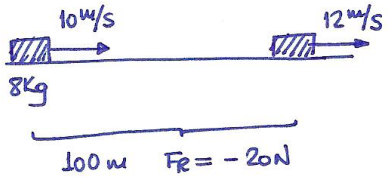
Datua: 1 ZP = 736 W

③ 

a) Kalkulatu zenbatekoa izan behar duen hasierako abiadura ("A") gorputza "C" punturaino iristeko.

b) Kalkulatu abiadura "B" puntuan.

Bidean ez dago marruskadura-indarra ezta kanpoko indazzik.

④ 

Kalkulatu zenbateko distantziaz egin behar den F= 50N -eko indarra, gorputzaren abiadura 10 m/s-tik 12 m/s-ra pasatzeko 100 m ibili ondoren. Marruskadura-indarra 20N-ekoa da.

① ⓐ Piezaren dimentsioak → Piezaren bolumena → Piezaren masa → Piezaren pisua

$R = 0'5\ m$ $\quad V = \frac{4}{3} R^3$

$V = \frac{4}{3} \pi R^3 = \frac{4}{3} \cdot \pi \cdot (0'5\ m)^3 = 0'52\ m^3$

$m = 0'52\ m^3 \ \frac{5600\ kg}{1\ m^3} = 2912\ kg$

$P = m \cdot g = 2912\ kg \cdot 10 \frac{m}{s^2} = \boxed{29.120\ N}$

ⓑ Piezaren bolumena = Desplazatutako uraren bolumena → Desplazatutako uraren masa →

→ Desplazatutako uraren pisua = Bultzada (E)

$V_{ura} = 0'52\ m^3 \longrightarrow m_{ura} = 0'52\ m^3 \ \frac{1000\ Kg}{1\ m^3} = 520\ kg \rightarrow$

$\rightarrow P_{ura} = m \cdot g = 520\ kg \cdot 10 \frac{m}{s^2} = \boxed{5.200\ N = E}$

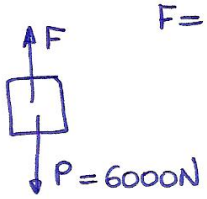
ⓒ Itxurazko pisua (P_i)

$P_i = P - E = 29.120N - 5.200N = \boxed{23.920N}$

ⓓ $P > E \rightarrow$ hondoratu egingo da

② ⓐ $P = F \cdot v = 6.000\ N \cdot 12 \frac{m}{s} = \boxed{72.000\ W}$

$F = P = m \cdot g = 600\ kg \cdot 10 \frac{m}{s^2} = 6.000N$



ⓑ $P = 72.000\ W \ \frac{1\ ZP}{736\ W} = \boxed{97'8\ ZP}$

③ ⓐ $E_{mek_{buk}} = E_{mek_{has}} + W_{F,Fr}$ (→ 0)

← $E_{mek_{buk}} = \frac{1}{2}mv^2 + mgh = 5\,kg \cdot 10\frac{m}{s^2} \cdot 20\,m = \boxed{1000\,J}$ ($v = 0$)

← $E_{mek_{has}} = \frac{1}{2}mv^2 + mgh = \frac{1}{2} \cdot 5\,kg \cdot v^2 + 5\,kg \cdot 10\frac{m}{s^2} \cdot 8\,m =$

$= \boxed{2'5\,kg \cdot v^2 + 400\,J}$

← $W_{F,Fr} = 0$

$1000\,J = 2'5\,kg \cdot v^2 + 400\,J \rightarrow v = \sqrt{\frac{1000\,J - 400\,J}{2'5\,kg}} = \boxed{15'5\,\frac{m}{s}}$

ⓑ $E_{mek_{buk}} = E_{mek_{has}} + W_{F,Fr}$ (→ 0)

← $E_{mek_{buk}} = \frac{1}{2}mv^2 + mgh = \frac{1}{2} \cdot 5\,kg \cdot v^2 = \boxed{2'5\,kg \cdot v^2}$ ($h = 0$)

← $E_{mek_{has}} = 2'5\,kg \cdot \left(15'5\,\frac{m}{s}\right)^2 + 400\,J = \boxed{1000\,J}$

← $W_{F,Fr} = 0$

$2'5\,kg \cdot v^2 = 1000\,J \rightarrow v = \sqrt{\frac{1000\,J}{2'5\,kg}} = \boxed{20\,\frac{m}{s}}$

④ $E_{mek_{buk}} = E_{mek_{has}} + W_{F,Fr}$

← $E_{mek_{buk}} = \frac{1}{2}mv^2 + mgh_{\parallel 0} = \frac{1}{2} \cdot 8Kg \cdot \left(12\frac{m}{s}\right)^2 = \boxed{576\ J}$

← $E_{mek_{has}} = \frac{1}{2}mv^2 + mgh_{\parallel 0} = \frac{1}{2} \cdot 8Kg \cdot \left(10\frac{m}{s}\right)^2 = \boxed{400\ J}$

← $W_{F,Fr} = 50N \cdot d - 20N \cdot 100\,m = \boxed{50N \cdot d - 2000\ J}$

$576\ J = 400\ J + 50N \cdot d - 2000\ J \longrightarrow 576\ J - 400\ J + 2000\ J = 50N \cdot d \rightarrow$

$\longrightarrow d = \frac{2176\ J}{50\ N} = \boxed{43'52\ m}$