XI. Dr.TORÓ LÁSZLÓ TALENTUM ORSZÁGOS VERSENY/ Döntő/ 2025. március. 8

CONCURSUL NAȚIONAL „TALENTUM dr.TORÓ LÁSZLÓ” – ediția a XI-a – 8 martie 2025

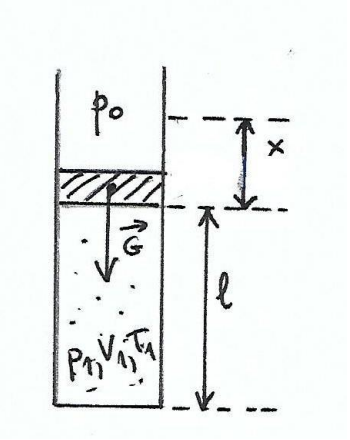
Tantárgy/ Disciplina: Fizika/Fizică
Osztály/ Clasa: X.

JAVÍTÓKULCS /BAREM

I. TÉTEL — 30 PONT

a)

$p_1 = p_0 + \frac{G}{S}$	3 p
p_1=állandó	1 p
$V_1=S\cdot l$	1 p
$V_2=S\cdot(l+x)$	1 p
$p_1\cdot(V_2-V_1)=\nu\cdot R\cdot(T_2-T_1)$	4 p
$x = \frac{\nu\cdot R\cdot \Delta T}{S\cdot(p_0+\frac{G}{S})}$	3 p
x=0,0822 m=8,22 cm	3 p



b)

$L = (p_0 + \frac{G}{S})\cdot S\cdot x$	3 p
L=16,62 J	2 p

c)

$p'=p_0$=állandó	1 p
$p'\cdot(V_2'-V_1)=\nu\cdot R\cdot(T_2-T_1)$	2 p
$V'_2=S\cdot(l+x')$	1 p
$x' = \frac{\nu\cdot R\cdot \Delta T}{p_0\cdot S}$	2 p
x’=0,1025 m=10,25 cm	3 p

II. TÉTEL — 40 PONT

a)	$T_2=2T$	3 p
	$T_3=6T$	3 p
	$T_4=3T$	3 p

$\eta = 1 - \frac{|Q_3|+|Q_4|}{Q_1+Q_2}$ 2 p

$Q_1=\nu\cdot C_{\mu V}\cdot(T_2-T_1)$ 1 p

$Q_2=\nu\cdot C_{\mu p}\cdot(T_3-T_2)$ 1 p

$Q_3=\nu\cdot C_{\mu V}\cdot(T_4-T_3)$ 1 p

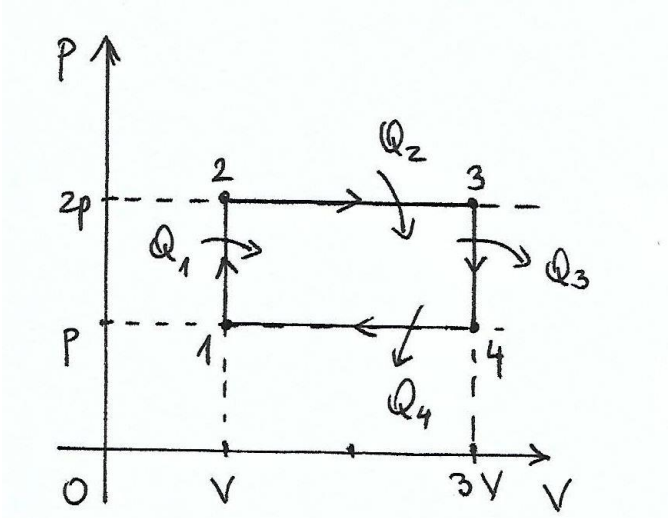
$Q_4=\nu\cdot C_{\mu p}\cdot(T_1-T_4)$ 1 p

$\gamma = \frac{C_{\mu p}}{C_{\mu V}} = \frac{5}{3}$ 2 p

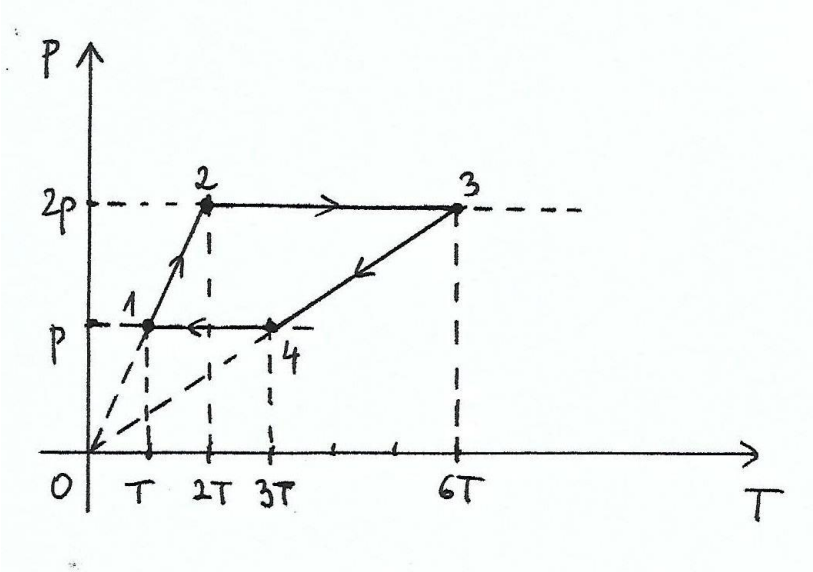
$\eta = \frac{2\cdot\gamma-2}{1+4\cdot\gamma}$ 5 p

η=17% 3 p

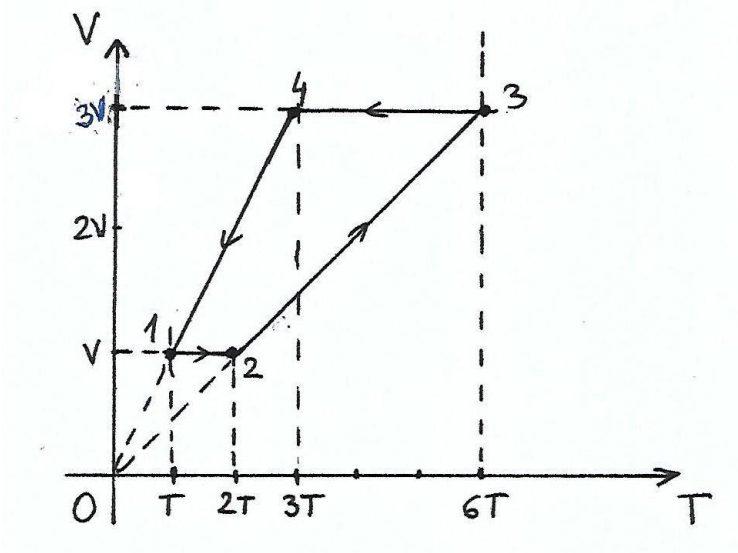
b)



5 p



5 p



5 p

III. TÉTEL **20 PONT**

$m_1=\rho \cdot V_1$	2 p
$m_2=\rho \cdot V_2$	2 p
$V=V_1+V_2$	1 p
$Q_{fel} = \lvert Q_{le} \rvert$	1 p
$Q_{fel} = m_1 \cdot c \cdot (T - T_1)$	2 p
$\lvert Q_{le} \rvert = m_2 \cdot c \cdot (T_2 - T)$	2 p
$V_1 = \frac{2}{3} \cdot V_2$	4 p
$V_2 = \frac{3V}{5} = 0{,}6\ l$	3 p
$V_1 = \frac{2V}{5} = 0{,}4\ l$	3 p