F-128 – Física Geral I

Aula exploratória 07

- Gabarito -

UNICAMP – IFGW

Exercício 1

a) $U(x) = \frac{1}{2}kx^2 - \frac{1}{3}\kappa x^3$

b) $x = 0$: *ponto de equilíbrio estável*

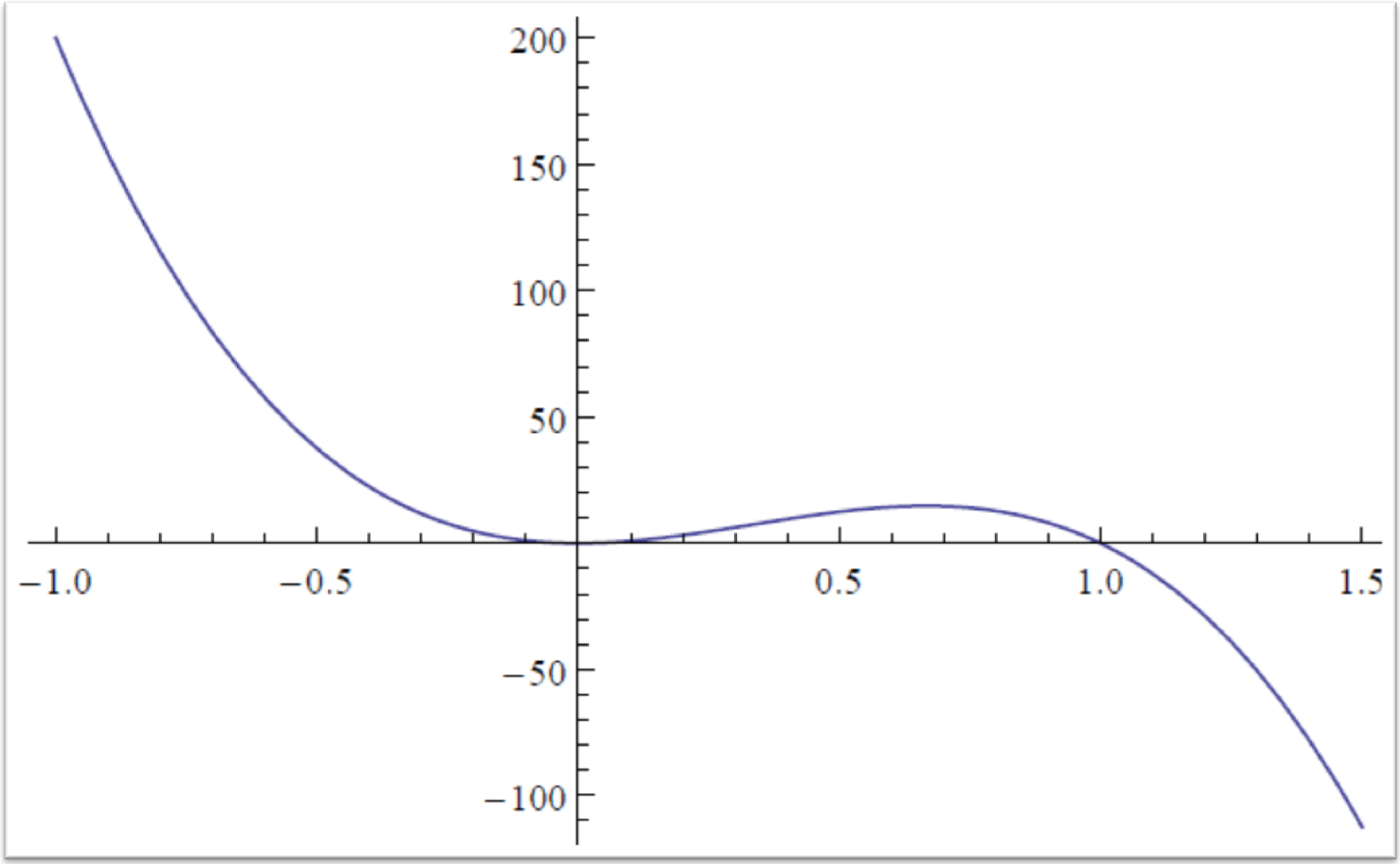
$x = \frac{2}{3}m$: *ponto de equilíbrio instável*

c) $x < \frac{2}{3}m; E < U(x = 2/3) = 400/27$

d) $E > \frac{400}{27}$: *há 1 ponto de retorno*

$E < \frac{400}{27}; x > \frac{2}{3}$: *há 1 ponto de retorno*

Exercício 1



Exercício 2

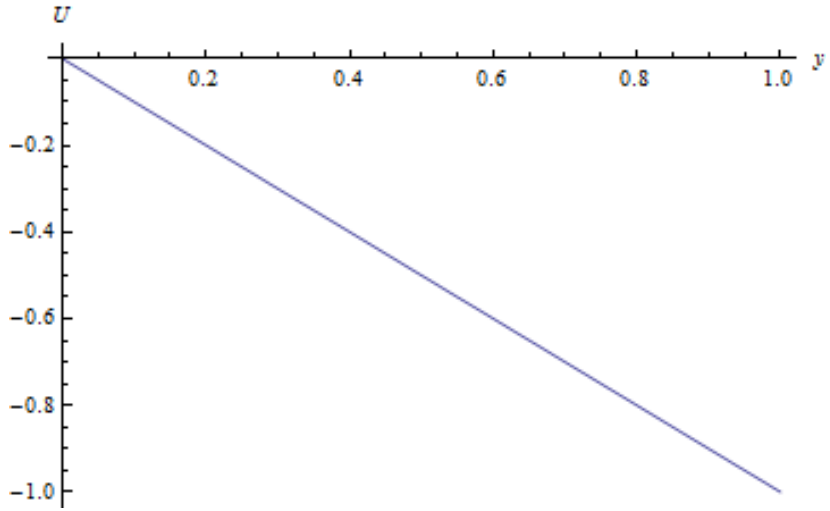
a) $U_g = -mgy$

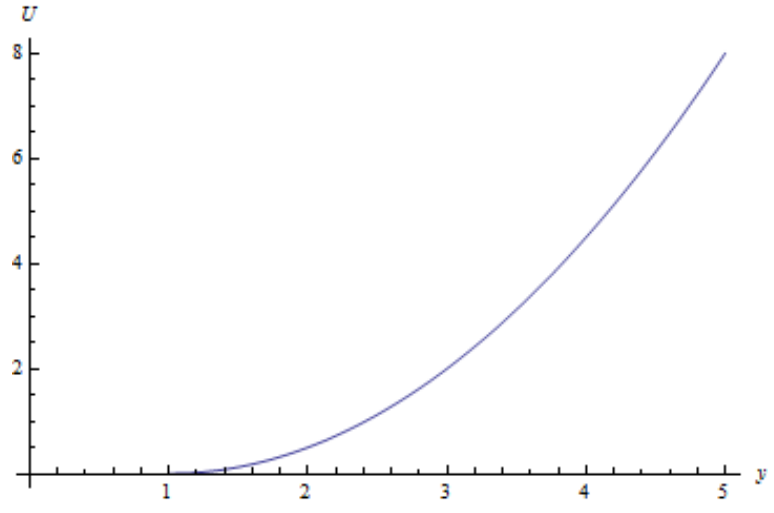
$$U_{el} = \frac{1}{2}k(y - L)^2$$

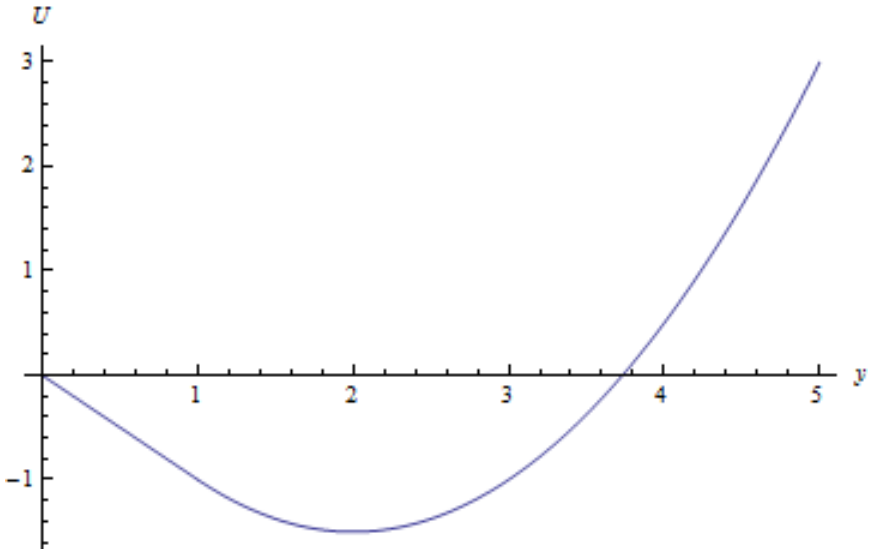
b) $y = L + \frac{mg}{k}$

c) $v_{max} = \left[2g\left(L + \frac{mg}{2k}\right)\right]^{1/2}$

Exercício 2







Obtidos parametrizando mg=1, k=1 e L=1.

Exercício 3

$$a)\ x_{max} = \frac{l}{2} + \frac{1}{2}(l^2 + 4ld)^{1/2} \text{ onde l} = \frac{2mg}{k}(sen\theta - \mu_c cos\theta)$$

$$b)\ E_{dis} = \mu_c mgcos\theta(d + x_{max});\ \frac{E_{dis}}{\Delta U_{Pot}} = 1$$

$$c)\ \mu_e = \frac{kx_{max} - mgsen\theta}{mgcos\theta}$$