

10 **Part B (10 points):** What is the work done by the conservative force as the particle travels from position $y = 0$ to position $y = b$? Express your answer in terms of the constants a , b , and c .

$$W = -\Delta U \quad (\vec{F}_{\text{cons}})$$

$$W = -[U_f - U_i]$$

$$U_f = U(y=b) = a(\cancel{b}/b)^2 - c\cancel{b} = -cb$$

$$U_i = U(y=0) = a(0-b)^2 - 0 = ab^2$$

$$\therefore W = -[-cb - ab^2] = ab^2 + cb \text{ J}$$

$$\boxed{W = ab^2 + cb \text{ J}}$$