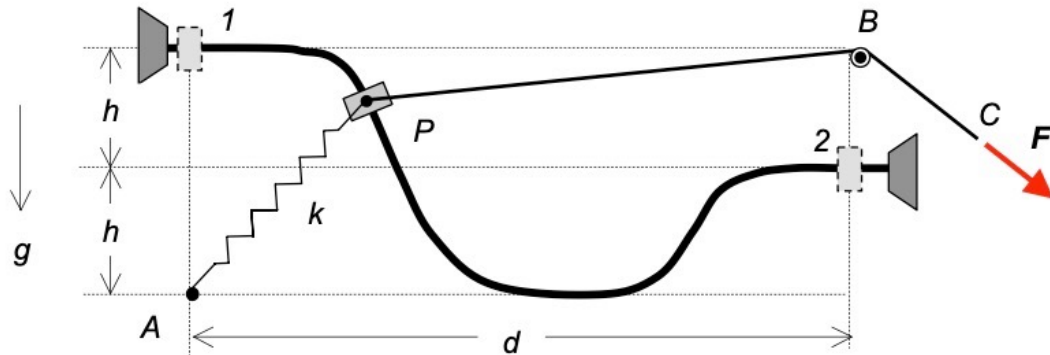# ME 274 – Spring 2024 – 11:30 – Quiz 5

Particle P is pulled from Position 1 to Position 2 over a smooth surface by the force F applied to cable.

Q1. Work done by friction, $U_{1 \to 2}^{(f)}$

a) $U_{1 \to 2}^{(f)} > 0$

b) $U_{1 \to 2}^{(f)} = 0$

c) $U_{1 \to 2}^{(f)} < 0$

d) more information is needed about the shape of the guide in order to determine the sign of $U_{1 \to 2}^{(f)}$.

Q2. Spring potential at position 2, $(V_2)_{sp}$

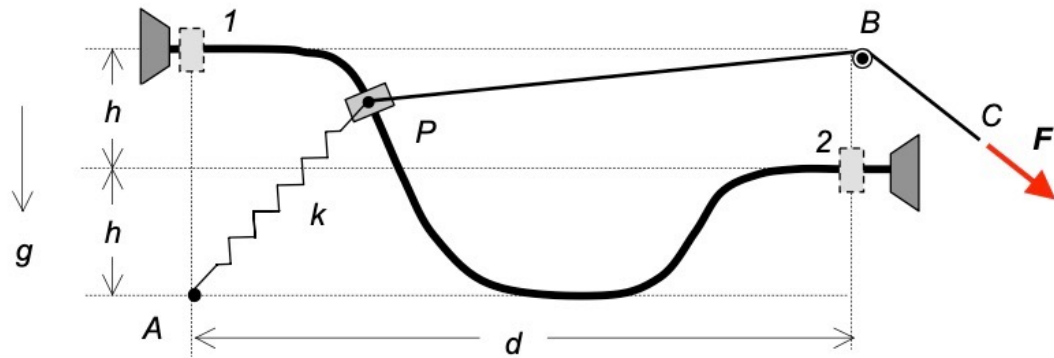*(Spring unstretched at position 1)*

a) $(V_2)_{sp} = \dfrac{1}{2} kd^2$

b) $(V_2)_{sp} = \dfrac{1}{2} kh^2$

c) $(V_2)_{sp} = \dfrac{1}{2} k(d - 2h)^2$

d) $(V_2)_{sp} = \dfrac{1}{2} k\left(d^2 - 4h^2\right)$

e) $(V_2)_{sp} = \dfrac{1}{2} k\left(\sqrt{d^2 + h^2} - 2h\right)^2$

f) more information is needed about the shape of the guide in order to determine $(V_2)_{sp}$.

Q3. Change in gravitational potential, $\Delta V_{gr} = (V_2)_{gr} - (V_1)_{gr}$

a) $\Delta V_{gr} > 0$

b) $\Delta V_{gr} = 0$

c) $\Delta V_{gr} < 0$

d) more information is needed about the shape of the guide in order to determine the sign of ΔV_{gr}.

Q4. Work done by the force F, $U_{1\to 2}^{(F)}$

a) $U_{1\to 2}^{(F)} = Fd$

b) $U_{1\to 2}^{(F)} = Fh$

c) $U_{1\to 2}^{(F)} = 2Fh$

d) $U_{1\to 2}^{(F)} = F(d + 2h)$

e) $U_{1\to 2}^{(F)} = F(d - h)$

f) $U_{1\to 2}^{(F)} = F(d - 2h)$

g) $U_{1\to 2}^{(F)} = F\left(\sqrt{d^2 + h^2}\right)$

h) more information is needed about the shape of the guide to determine $U_{1\to 2}^{(F)}$.