Phys 218 – Fall 2018

All *University Physics* Sections

Exam II

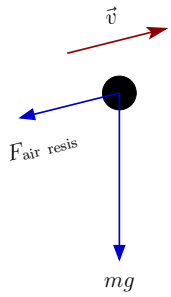
Short Answer:

A) (a), (b) and (c) are all true [LO 14.1, 14.2, 34.1, 38.1, 40.1]

B) a) $W = -\mu_k(mg - F\sin\theta)\Delta x$ [LO 1.1, 21.1, 26.1, 27.1 28.1, 32.1]

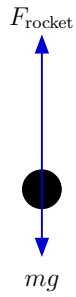
b) "No", friction is not a conservative force. It is not path independent, but rather depends on the distance travelled (versus displacement). [LO 36.1, 37.1]

C) (a)



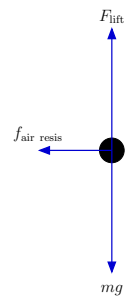
[LO 23.1, 30.1]

(b)



[LO 23.2, 30.2]

(c)

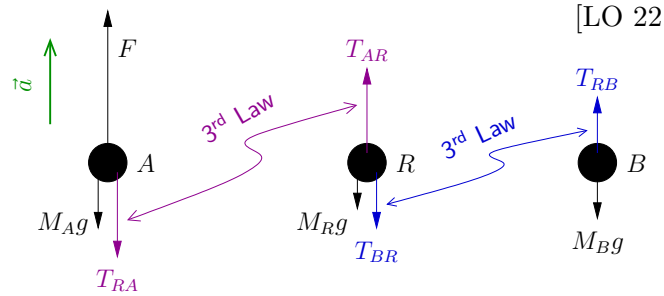


[LO 23.3, 30.3, 30.4]

D) a) (iv) is correct [LO 37.2, 41.1, 42.1]

b) (iii) is correct [LO 37.3, 41.2, 42.2]

Problem 1: a) [LO 22.1, 22.2, 23.4, 24.1, 30.5]



b) $a = 10$ m/s^2 [LO 3.1, 17.1, 21.2]

c) $T_{RA} = 180$ N [LO 4.1, 21.3, 22.3, 24.2, 24.3]

Problem 2:

a) Yes, $U(x) = \alpha/x$ [LO 8.1, 36.2, 37.4]

b) $v_d = \sqrt{v_D^2 - \frac{2\alpha(D-d)}{mdD}}$ [LO 3.2, 34.2, 37.5, 39.1]

c) $x = \frac{D}{1+\frac{mv_D^2 D}{2\alpha}}$ [LO 3.3, 37.6, 39.2]

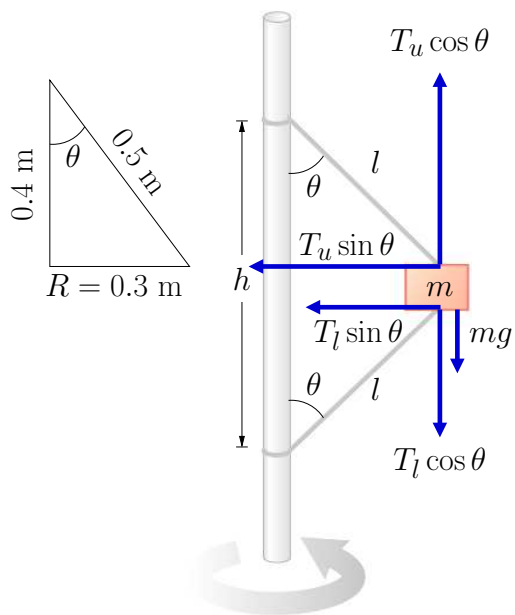
d) The same speed it started with, v_D [LO 34.3, 36.3, 39.3]

Problem 3:

a) $v = 6$ m/s [LO 4.2, 9.1, 21.4, 26.2, 27.2, 28.2, 32.2, 34.4, 38.2, 40.2]

b) $k = 8$ N/cm [LO 4.3, 9.2, 10.1, 21.5, 26.3, 27.3, 28.3, 32.3, 38.3, 40.3]

Problem 4: a)



[LO 1.2, 9.3, 23.5, 24.4, 24.5]

b) $T_{\text{lower}} = 275$ N [LO 1.3, 3.4, 21.6]

c) $v = \sqrt{27}$ m/s [LO 1.4, 3.5, 18.1, 19.1, 21.7]