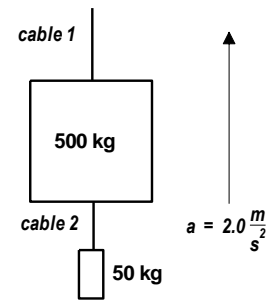
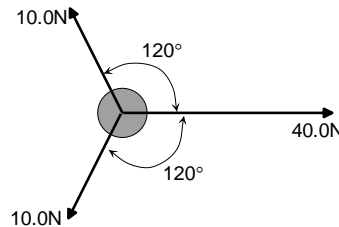


SPH4UI – Unit 1B : Linear Dynamics : Review Problems

1. A 50 kg mass is suspended below an elevator with mass 500kg. If the elevator and suspended mass are accelerating upwards at 2.0m/s^2 , what is the tension in each cable? (assume 2 significant digits).

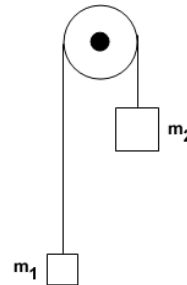


2. Three horizontal forces act on a 1.9 kg object as shown below. If the coefficient of kinetic friction with the ground is 0.63, calculate the acceleration of the object.

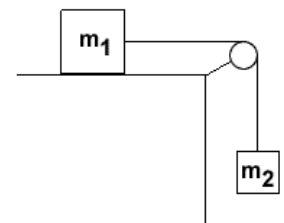


3. Two Atwood machines are setup as illustrated to the right. Mass 1 (m_1) is 10kg and Mass 2 (m_2) is 12kg. Calculate the overall acceleration and tension in the rope in both situations. (in both cases you can assume zero friction and the pulley is massless)

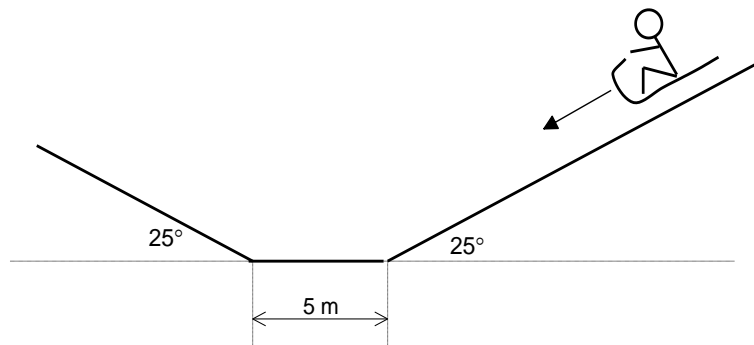
a.



b.



4. A 65kg boy and his toboggan (combined mass) are sliding down a snow covered hill ($\mu_k=0.25$). The boy slides down the hill, across a short horizontal section (5m) and then travels up the other side of the hill before coming to a rest. If the boy starts at rest and 20 m up from the bottom of the hill, how far up the other side of the hill will the boy go before stopping?



Answers:

1. cable 1 – $F_t=6.5 \times 10^3\text{N}$, cable 2 – $F_t=5.9 \times 10^2\text{N}$

2. $a=9.6\text{m/s}^2$ [right]

3a. $a=0.89\text{m/s}^2$, $F_t=110\text{N}$, b. $a=5.3\text{m/s}^2$, $F_t=53\text{N}$

4. $d=4.1\text{m}$ (up the hill)