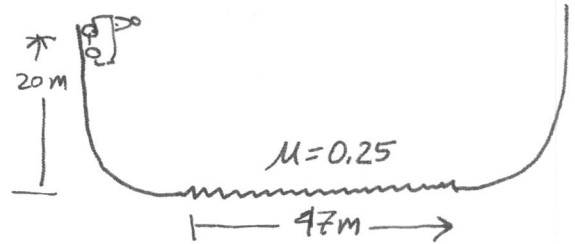


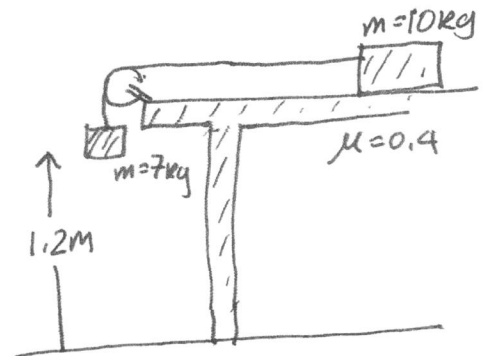
A&B Energy Problem Set

1. A new ride at Great America has a 220 kg cart that falls from a height of 20 m. The whole track is totally frictionless except for a 47 m long stretch in the middle that has a coefficient of friction of 0.25.

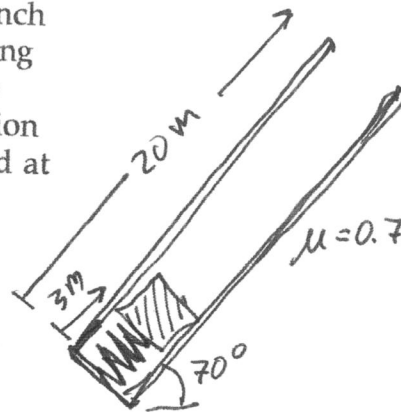


- a) After one pass, what height will the cart reach?
- b) How much heat is lost in the friction stretch?
- c) How much speed does the cart lose every pass?
- d) How many times back and forth will the cart go?
- e) Where does it stop?

- 2) A 7kg mass is pulling a 10 kg mass across a table with a coefficient of friction of 0.4. Using energy considerations only, how fast will they be going when the falling mass has dropped 1.2 m to the floor?



- 3) a) A 20m long cannon uses a spring to launch it's 100kg cannonball. The spring has a spring constant of 58000 N/m. It is 6m long and is compressed to 3m. If the coefficient of friction in the cannon is 0.7 and the cannon is aimed at an angle of 70 degrees, how fast is the cannonball going as it leaves the cannon?



- b) What's the maximum height the cannonball will reach? (Hint: Calculate the horizontal speed as it leaves the cannon.)