

SPH4C Exam Review

Part 2: Problem Solving

1. Starting from rest, Jacob accelerates to a velocity of 4.6 m/s [E] in 2.0 s.
 - (a) What was Jacob's acceleration?

 - (b) What was the distance Jacob travelled while accelerating?

2. Dalton pushes a crate of weight 320 N across a horizontal floor with a force of 110 N. The coefficient of kinetic friction between the crate and the floor is 0.30.
 - (a) What is the magnitude of the frictional force acting on the crate?

 - (b) What is the net force on the crate?

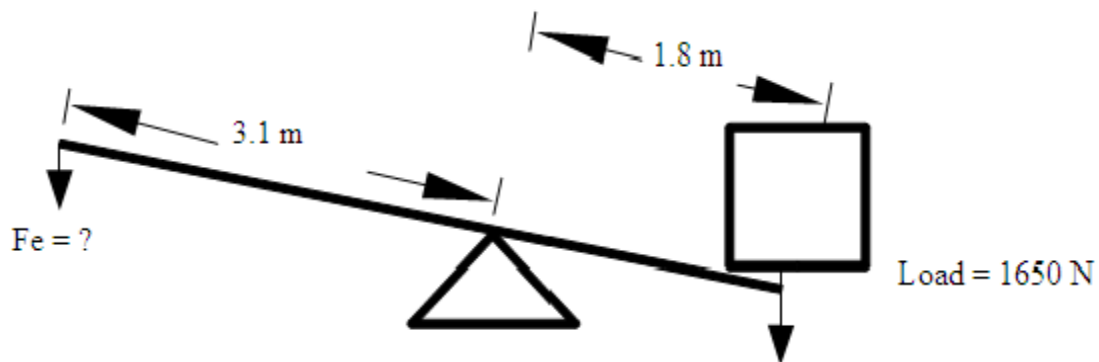
3. Eric uses a force of 180 N to push a crate of weight 320 N at constant speed up a ramp with a length of 3.6 m and a rise of 1.2 m.
 - (A) What is the ideal mechanical advantage of the ramp?

(B) What is the actual mechanical advantage of the ramp?

4. Victoria is trying to lift a crate using a lever as shown below. The crate has a weight of 1650 N and is 1.8 m from the fulcrum.

(a) What is the load torque on the lever?

(b) If the effort force is applied 3.1 m from the fulcrum, what is its magnitude?



5. Connor's car brakes exert a force of 12 000 N [backwards] over a distance of 24 m along a level piece of highway.

(a) Determine the work done by the brakes.

(b) Is the work in (a) positive or negative? What does this mean?

6. Brandan drops a 1.5 kg water balloon from a 14 m high roof.

(a) What is the gravitational potential energy of the balloon on the roof?

(b) What is the speed of the balloon when it hits the ground?

7. 9-V is supplied to a circuit containing a single light bulb. The current through the circuit is 3.0 A.

(a) What is the resistance of the bulb?

(b) What is the power consumed by the bulb?

8. You have three resistors, each with a resistance of $12\text{-}\Omega$.
- (a) What is their resistance if the resistors are in series?
- (b) What is their resistance if the resistors are in parallel?
9. In a manometer filled with water, the difference between the heights of the two columns is 6 cm (0.06 m).
- (a) What is the gauge pressure on the lower column?
- (b) What is the absolute pressure on the lower column?
10. In a hydraulic press, the master cylinder with an area of 0.04 m^2 applies a force of magnitude 110 N.
- A. What is the pressure applied by the master cylinder?
- B. What is the magnitude of the force on the slave cylinder if it has an area of 0.24 m^2 ?