TPHYS 121 Workshop Week 5

Module 2 Problems

Exercise(s) 5.25, 5.26

Each of the following describes a situation, draw a free-body diagram

   a Your physics textbook is sliding across the table.

   b A steel beam, suspended by a single cable, is being lowered by crane at a steadily decreasing speed.

Exercise 4.16

On the Apallo 14 mission to the moon, astronaut Alan Sheperd hit a golf ball with 6 iron. The free-fall acceleration on the moon is $1/6$ of it's value on earth. Suppose he hit the ball with a speed of $25m/s$ at a $30°$ angle above the horizontal.

   a How much farther did the ball travel on the moon than it would have on earth?

   b For how much more time was the ball in flight?

Exercise 4.19

When the moving sidewalk at the airport is broken, as it often seems to be, it takes you to walk $50s$ from your gate to baggage claim. When it is working and you stand on the moving sidewalk the entire way, without walking, it takes $75s$ to travel the same distance. Assuming you weigh $100kg$ how long will it take you to travel from the gate to baggage claim if you walk while riding on the moving sidewalk?

Module 3 Problems

Exercise 7.14

The sled dog in the figure sleds A and B across the snow. The coefficient of friction between the sleds and snow is 0.10. If the tension in rope 1 is $150N$, what is the tension in rope 2?
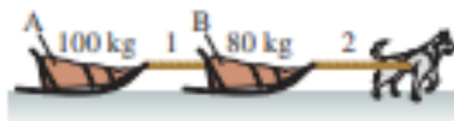
Exercise 7.2

A weightlifter stands up at constant speed from a squatting position while holding a heavy barbell across his shoulders.

  a Draw an interaction diagram

  b Identify the "system" on your interaction diagram.

  c Draw a free-body diagram for each object in the system. Use dashed lines to connect members of an action/reaction pair.

Exercise 8.23

While at the county fair, you decide to ride the Ferris wheel. Having eaten too many candy apples and elephant ears, you find the motion somewhat unpleasant. To take your mind off your stomach, you wonder about the motion of the ride. You estimate the radius of the big wheel to be $15m$, and you use your watch to find that each loop around takes $25s$.

  a What are your speed and the magnitude of your acceleration?

  b What is the ratio of your weight at the top of the ride to your weight while standing on the ground?

  c What is the ratio of your weight at the bottom of the ride to your weight while standing on the ground?

Exercise 6.11

The figure bellow shows the force acting on a $2.0kg$ object as it moves along the x-axis. The object is at rest at the origin at $t = 0s$. What is the acceleration and velocity at $t = 6s$?.
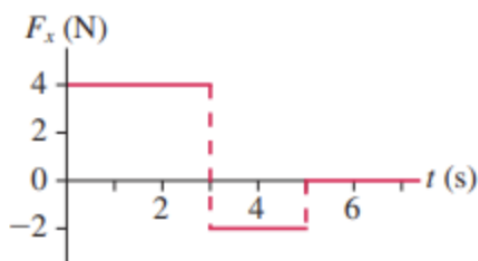
Additional Resources

- Flipping Physics on youtube: `https://www.youtube.com/user/flippingphysics`