

## Chapter 1: Forces

- 1) The coefficient of static friction between a tennis player's hand and her racket is 0.45. How hard must she squeeze the racket if she wants to exert a force of 200 N along its longitudinal axis?
  
- 2) The coefficient of static friction between the sole of an athletic shoe and the basketball court floor is 0.67. Tyler wears these shoes when he plays basketball. If Tyler exerts a normal contact force of 1400 N when he pushes off the floor to run down the court, how large is the friction force exerted by Tyler's shoes on the floor?
  
- 3) A sprinter is just coming out of the starting block, and only one foot is touching the block. The sprinter pushes back (horizontally) against the block with a force of 500 N and down (vertically) against the ground with a force of 800 N. What is the resultant of these forces?
  
- 4) A 60-kg skier is in a tuck and moving straight down a 30° slope. Air resistance pushes backward on the skier with a force of 10 N (this force acts in a direction upward and parallel to the 30° slope). The coefficient of dynamic friction between the skis and the snow is 0.08. What is the resultant force that acts on the skier?
  
- 5) The ground reaction force acting on a long jumper is 4500 N acting forward and upward at an angle of 78° from horizontal.
  - a. What is the vertical component of this ground reaction force?
  - b. What is the horizontal component of this ground reaction force?
  
- 6) A golfball leaves the tee with a horizontal velocity of 50 m/s and a vertical velocity of 7 m/s.
  - a. What is the direction the ball is traveling?
  - b. What is the magnitude of the resultant velocity as it leaves the tee?