

Physics 117 HW Set #1

{ Ch 2: Q 31, 38, 48; E: 5, 9, 21 }
{ Ch 3: Q 4, 7; E: 1, 8. }

31. Assume that an airplane accelerates from 550 mph to 555 mph, a car accelerates from 60 mph to 67 mph, and a bicycle accelerates from 0 to 10 mph. If all three vehicles accomplish these changes in the same length of time, which one (if any) has the largest acceleration?
38. You throw a ball straight up in the air. The instant after leaving your hand the ball's speed is 30 meters per second. Ignoring the effects of air resistance, predict how fast the ball will be traveling 2 seconds later.
48. A Ping-Pong ball and a golf ball have approximately the same size but very different masses. Which hits the ground first if you drop them simultaneously from a tall building? Do not neglect the effects of air resistance.
5. In 1989 Ann Trason broke the U.S. women's record for a 24-h run by covering a distance of 143 miles. What was her average speed?
- *9. Starting at 9 A.M., you hike for 3 h at an average speed of 4 mph. You stop for lunch from noon until 2 P.M. What is your average speed over the interval from 9 A.M. to 2 P.M.?
21. You are trying to decide whether to jump off a cliff into the water below, but you cannot judge the height of the cliff. You drop a pebble and note that it takes 2 s to hit the water. How high is the cliff?
4. If you give this book a shove so that it moves across a tabletop, it slows and comes to a stop. How can you reconcile this observation with Newton's first law?
7. Why does a tassel hanging from the rearview mirror appear to swing forward as you apply the brakes?
1. Find the size of the net force produced by a 6-N and an 8-N force in each of the following arrangements:
a. The forces act in the same direction.
b. The forces act in opposite directions.
c. The forces act at right angles to each other.
8. The net horizontal force on a 60,000-kg railroad boxcar is 6000 N. What is the acceleration of the boxcar?