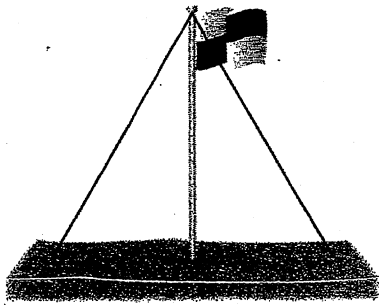


71. A parcel of land is 6 ft longer than it is wide. Each diagonal from one corner to the opposite corner is 174 ft long. What are the dimensions of the parcel?
72. A flagpole is secured on opposite sides by two guy wires, each of which is 5 ft longer than the pole. The distance between the points where the wires are fixed to the ground is equal to the length of one guy wire. How tall is the flagpole (to the nearest inch)?



73–74 ■ Suppose an object is dropped from a height h_0 above the ground. Then its height after t seconds is given by $h = -16t^2 + h_0$, where h is measured in feet. Use this information to solve the problem.

73. If a ball is dropped from 288 ft above the ground, how long does it take to reach ground level?
74. A ball is dropped from the top of a building 96 ft tall.
- How long will it take to fall half the distance to ground level?
 - How long will it take to fall to ground level?

75–76 ■ Use the formula $h = -16t^2 + v_0t$ discussed in Example 8.

75. A ball is thrown straight upward at an initial speed of 40 ft/s.
- When does the ball reach a height of 24 ft?
 - When does it reach a height of 48 ft?
 - What is the greatest height reached by the ball?
 - When does the ball reach the highest point of its path?
 - When does the ball hit the ground?
76. How fast would a ball have to be thrown upward to reach a maximum height of 100 ft? [Hint: Use the discriminant of the equation $16t^2 - v_0t + h = 0$.]
77. The fish population in a certain lake rises and falls according to the formula

$$F = 1000(30 + 17t - t^2)$$

Here F is the number of fish at time t , where t is measured

in years since January 1, 1992, when the fish population was first estimated.

- On what date will the fish population again be the same as on January 1, 1992?
 - By what date will all the fish in the lake have died?
78. A wire 360 in. long is cut into two pieces. One piece is formed into a square and the other into a circle. If the two figures have the same area, what are the lengths of the two pieces of wire (to the nearest tenth of an inch)?
79. A salesman drives from Ajax to Barrington, a distance of 120 mi, at a steady speed. He then increases his speed by 10 mi/h to drive the 150 mi from Barrington to Collins. If the second leg of his trip took 6 min more time than the first leg, how fast was he driving between Ajax and Barrington?
80. Kiran drove from Tortula to Cactus, a distance of 250 mi. She increased her speed by 10 mi/h for the 360-mi trip from Cactus to Dry Junction. If the total trip took 11 h, what was her speed from Tortula to Cactus?
81. It took a crew 2 h 40 min to row 6 km upstream and back again. If the rate of flow of the stream was 3 km/h, what was the rowing rate of the crew in still water?
82. A factory is to be built on a lot measuring 180 ft by 240 ft. A local building code specifies that a lawn of uniform width and equal in area to the factory must surround the factory. What must the width of this lawn be, and what are the dimensions of the factory?
83. Henry and Irene working together can wash all the windows of their house in 1 h 48 min. Working alone, it takes Henry $1\frac{1}{2}$ h more than Irene to do the job. How long does it take each person working alone to wash all the windows?
84. Jack, Kay, and Lynn deliver advertising flyers in a small town. If each person works alone, it takes Jack 4 h to deliver all the flyers, and it takes Lynn 1 h longer than it takes Kay. Working together, they can deliver all the flyers in 40% of the time it takes Kay working alone. How long does it take Kay to deliver all the flyers alone?