***Example #1***: A rectangular building lot is 8 ft longer than it is wide and has an area of 2900 ft². Find the dimensions of the lot.

***Example #2***: A man 6 ft tall wishes to find the height of a certain four-story building. He measures its shadow and finds it to be 28 ft long, while his own shadow is 3½ ft long. How tall is the building?

1. Find the three consecutive integers whose sum is 156.
2. What annual rate of interest would you have to earn on an investment of $3500 to ensure receiving $262.50 interest after one year?
3. A woman earns 15% more than her husband. Together they make $69,875 per year. What is the husband’s annual salary?
4. Helen earns $7.50 an hour at her job, but if she works more than 35 hours in a week she is paid 1½ times her regular salary for the overtime hours worked. One week her gross pay was $352.50. How many overtime hours did she work that week?
5. A father is four times as old as his daughter. In 6 years, he will be three times as old as she is. How old is the daughter now?
6. Mary has $3.00 in nickels, dimes, and quarters. If she has twice as many dimes as quarters and five more nickels than dimes, how many coins of each type does she have?
7. Find the length x in the figure. The area of the shaded region is given.

10 cm

 x

 6 cm

 x

 Area = 144 cm²

1. A rectangular garden is 10 ft longer than it is wide. Its area is 875 ft². What are the dimensions?
2. A 19½-foot ladder leans against a building. The base of the ladder is 7½ ft from the building. How high up the building does the ladder reach?
3. A man is walking away from a lamppost with a light source 6 m above the ground. The man is 2 m tall. How long is the man’s shadow when he is 10 m from the lamppost? (*Hint*: Use similar triangles.)
4. 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?
5. Two cyclists, 90 mi apart, start riding toward each other at the same time. One cycles twice as fast as the other. If they meet 2 h later, at what average speed is each cyclist traveling?
6. A large plywood box has a volume of 180 ft³. Its length is 9 ft greater than its height, and its width is 4 ft less than its height. What are the dimensions of the box?
7. A 10-ft-long stem of bamboo is broken in such a way that its tip touches the ground 3 ft from the base of the stem, as shown in the figure. What is the height of the break?