

1. Find two numbers whose sum is 55 and whose product is 684.
2. Given the statements,
  - Find two consecutive integers such that the sum of their squares is 85.
  - Find two consecutive positive integers such that the sum of their squares is 85.

(a) discuss the similarities and differences, if any.

(b) Solve each problem.
3. The square of three more than a number is nine. Find the number(s).
4. The square of two less than an integer is sixteen. Find the number(s), if any.
5. The sum of the squares of two consecutive even integers is 1252. Find the numbers, if any.
6. Two trucks haul debris from a construction site. The site is cleared after two hours. If the larger truck worked alone, it could clear the site three hours earlier than the smaller truck working alone. How long would it take each truck to clear the site if it worked alone?
7. A rectangular picture frame is 15 inches by 12 inches. The area of the largest picture that can be displayed in the frame is 108 square inches. What is the width of the frame?
8. A rectangular garden with a surrounding path of uniform width is 30 feet long and 20 feet wide. If the area of the garden surrounded by the path is 336 square feet, how wide is the path?
9. A box with a square base and no top is constructed from a square piece of cardboard by cutting four-inch squares from each corner and folding up the sides. If the volume of the box is 100 cubic inches, what are the dimensions of the cardboard that is used to make the box?
10. A rectangular box with no top is constructed from a rectangular piece of cardboard by cutting five-inch squares from each corner and folding up the sides. If the volume of the box is 480 cubic inches, what are the dimensions of the piece of cardboard if the length of the box is four inches greater than the width?
11. A rectangular garden is 60 feet by 80 feet. Part of the garden is torn up to install a sidewalk of uniform width around the garden. How wide is the sidewalk if the area of the new garden is half the area of the original garden?
12. If you position a 20-foot ladder so that the height of the top of the ladder above the ground is four feet more than the distance that the bottom of the ladder is from the building, how far from the building is the bottom of the ladder?
13. After driving the 300 miles, you realize that you could have arrived one hour earlier if you had driven ten miles per hour faster. At what speed did you drive?
14. The length of a rectangular parking lot is twice its width. If the area of the parking lot is 162 square feet, what are the dimensions of the parking lot?
15. After a long night of studying for an exam, you close your books and go to sleep. In the morning you decide to check some information that you organized in the margins of two facing pages of one of your textbooks. Unfortunately, all you can remember is that the product of the page numbers is 812. Rather than getting upset, you decide to use the mathematics that you have been studying to determine the page numbers. What are the page numbers?
16. If the current of a river is 4 miles per hour and if it takes 4.5 hours to travel 24 miles upriver and to return, how fast could your boat travel in still water?