1. Not wanting to get any speeding tickets, you drive at the speed limit. Due to the posted speed limits, you must drive the first 120 miles of your trip at a rate that is 10 miles per hour faster than the speed at which you drive during the second part of your trip. If you drive the 220-mile distance in 4 hours, how fast did you drive during each part of the trip?

2. Working together, Jones and Smith can complete a job in four hours. Working alone, Smith takes six hours more than Jones to complete the job. How long would it take for each complete the job if they work alone?

3. One side of a rectangular courtyard is three feet longer than twice the length of the other side. The area of the courtyard is 275 square feet. Determine the dimensions of the courtyard.

4. At 8 AM a train traveling at 120 kilometers per hour leaves Station A and heads toward Station B, which is 350 kilometers away. Two hours later a freight train leaves Station B and travels at 50 kilometers per hour toward Station A. How far from Station A do the trains pass each other? When does this occur?

5. City A is 1,000 kilometers away from City B. An airplane took one hour longer to travel from A to B against a headwind than it did for the return trip with the same wind. Determine the speed of the wind, if the average speed of the airplane in still air is 200 kilometers per hour.

6. It took a boat ten minutes longer to travel six kilometers up a river than it did for the return trip. If the rate of the boat in still water was 12 kilometers per hour, determine the rate of the current.

7. During a sales trip, a merchant pays duty on the goods at three different locations. At the first location, the merchant gives one third of the goods as the duty; at the second location, the merchant gives one fourth of the remaining goods as the duty; and at the third location, the merchant gives one fifth of the remainder as the duty. If the total duty is twenty-four units, with how may units did the merchant start the trip?

8. The sum of two numbers is nine and their difference is six. What are the numbers?

9. Find two numbers whose sum is seven if one number is three times the other.

10. At a particular college, every incoming freshman is required to take a writing test. If a student achieves the minimum specified level on the test, the student enrolls in an English composition course; otherwise, the student must enroll in a writing fundamentals course. In a freshman class having 1,240 students, there are more students enrolled in the writing fundamentals course than in the English composition course. However, if thirty more students had attained the minimum required level on the test, each course would have the same enrollment. How many students are enrolled in each course?

11. The sum of the reciprocals of two consecutive even integers is $\dfrac{9}{40}$. What are the integers?

12. Are there two consecutive even integers for which the sum of the reciprocals is $\dfrac{8}{45}$? If these numbers exist, find them. If they do not exist, prove it.

13. Two trains leave railroad terminals 600 miles apart at the same time traveling toward each other on nonintersecting tracks. One train travels sixty miles per hour and the other train travels at seventy-five miles per hour. How far does the slower train travel before the trains pass each other? When do the trains pass each other?

14. Two trains, initially 150 miles apart, move toward each other on the same track at a rate of sixty miles per hour. A fly starts on the front of the first train and flies at a rate of eighty miles per hour toward the second train. When the fly touches the second train, it immediately turns and flies toward the first train without losing speed. The fly continues to soar back and forth in this manner until the trains collide and the fly is squashed. What is the total distance traveled by the fly on its back-and-forth journey?