

1. Since you do not want to get any speeding tickets on your trip home for Thanksgiving, you decide to drive at the speed limit. Due to the posted speeds you must drive the first part of your trip, 120 miles, 10 miles per hour faster than the second part of your trip. If you drive the 220 miles 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. Working alone, how long does each take to complete the job?
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. Find 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 1000 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. Find the speed of the wind, given the speed of the airplane in still air is 200 kilometers per hour.
6. It took a boat ten minutes longer to go 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, find the rate of the current.
7. A merchant pays duty on certain goods at three different places. At the first, he gives one third of the goods, at the second, one fourth of the remainder, and at the third, one fifth of the remainder. The total duty is twenty-four units. What was the number of units with which he started?
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 and one of which is three times the other.
10. Every freshman student at a particular college is required to take an English aptitude test. A student who passed the examination enrolls in English Composition and a student who fails the test must enroll in English Fundamentals. In a freshman class of 1240 students, there are more students enrolled in English Fundamentals than English Composition. However, if thirty more students had passed the test, each course would have the same enrollment. How many students are taking each course?
11. The sum of the reciprocals of two consecutive even integers is $\frac{9}{40}$. What are the integers?
12. Are there two consecutive even integers for which the sum of the reciprocals is $\frac{8}{45}$? 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. Each train travels sixty miles per hour. A fly starts on the front of the first train and flies at 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 fly 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?