

## **EXTRA PRACTICE — Exercises**

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### **Unit VI – Second Degree Relations and Higher - Algebraic Fractions**

#### **Part C – Problem Solving with Algebraic Fractions**

#### **Lesson 3 – “Motion” Problems**

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For each of the following story problems, answer the four analysis questions to find the equation needed to solve. Then solve and use common sense to check your answer.

1. One bus left a terminal traveling east at eighty kilometers per hour. A second bus left an hour and a half later traveling west at ninety kilometers per hour. At what time will the buses be four hundred sixty kilometers apart?
  
  
  
  
2. A car travels three hundred kilometers in the same time that a train travels two hundred kilometers. The speed of the car is twenty kilometers per hour more than the speed of the train. Find the speed of the car and the speed of the train.
  
  
  
  
3. A plane can fly the two thousand miles from Chicago to Los Angeles against a fifty miles per hour wind in a time of four hours. The return trip with the wind takes  $3\frac{1}{2}$  hours. Find the speed of the plane in still air.
  
  
  
  
4. A boat travels at a rate of fifteen kilometers per hour in still water. It travels sixty kilometers upstream in the same time that it travels ninety kilometers downstream. What is the rate of the current?
  
  
  
  
5. Rob can jog to Jack's house in ten minutes, and Rob and Jack live  $1\frac{1}{2}$  miles apart. Jack rides his bike at a rate of 6 m.p.h. faster than Rob can run. Jack can ride his bike to Rob's house in six minutes. If they start from their houses at the same time, in how many minutes will they meet?
  
  
  
  
6. Two candles are the same length. One burns up in six hours and the other in nine hours. If they are both lighted at the same time, how long is it before one is twice as long as the other?

## **EXTRA PRACTICE — Answer Key**

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For each of the following story problems, answer the four analysis questions to find the equation needed to solve. Then solve and use common sense to check your answers.

1. The buses will be 460 km apart when the first bus has traveled for  $3\frac{1}{2}$  hours. The second bus will have traveled 2 hours.
2. The rate of the train is 40 kilometers per hour. The rate of the car is 60 kilometers per hour.
3. The speed of the plane in still air is 350 m.p.h.
4. The rate of the current is 3 kilometers per hour.
5. Rob's rate is 9 m.p.h. and Jack's rate is 15 m.p.h.  
They will meet in 3.75 minutes or 3 minutes 45 seconds.
6. At  $4\frac{1}{2}$  hours,  $\frac{1}{4}$  of candle #1 is left and  $\frac{1}{2}$  of candle two is left. Since they were the same length to start with, Candle #2 is now twice the length of candle #1 at  $4\frac{1}{2}$  hours.