***Pre-Calculus 11***

***Unit 7: Rational Expressions and Equations***

***Worksheet 7.6—Applications of Rational Equations***

1. The average speed of an airplane is eight times as fast as the average speed of a train.

 To travel 1200 km, the train requires 14 h more than the airplane.

 Determine the average speeds of the train and the airplane.

2. The sum of two numbers is 12. The sum of their reciprocals is $\frac{3}{8}.$ what are the numbers?

3. Jerry and Elaine, working together, can paint a room in 3h. It would take Jerry 5 hours to

 paint the room by himself. How long would it take Elaine to pain the room by herself?

4. An elevator goes directly from the ground up to the observation deck of the Calgary Tower,

 which is 160 m tall. The elevator stops at the top for 36 seconds before it travels directly

 back down to the ground. The time for the round trip is 2.5 min. The elevator descends

 at 0.7 m/s faster than it goes up.

 a) Determine an equation that could be used to find the rate of ascent of the elevator.

 b) Simplify your equation to the form$ ax^{2}+bx+c=0$, where $a$, *b*, and *c* are integers, and

 then solve.

 c) What is the rate of ascent in kilometers per hour, to the nearest tenth?

5. A plane is flying from Winnipeg to Calgary against a strong headwind of 50 km/h. The plane

 takes ½ h longer for this flight that it would take in calm air. If the distance from Winnipeg to

 Calgary is 1200 km, what is the speed of the plane in calm air, to the nearest kilometer per

 hour?

6. Two consecutive numbers are represented by x and x+1. If 6 is added to the first number and

 two is subtracted from the second number, the quotient of the new numbers is $\frac{9}{2}$. Determine

 the numbers algebraically.

7. The sum of the reciprocals of two consecutive integers is $\frac{11}{30}$. What are the integers?

8. A drama class collected the same amount from each student going on a trip to the theatre.

 When six students could not go, each of the remaining students was charged an extra $3. If

 the total cost was $540, how many students went on the trip?

9. Two hoses together fill a pool in 2 hours. If only hose A is used, the pool fills in 3 hours.

 How long would it take to fill the pool if only hose B were used?

***Solutions***

1. The average speed of the train is 75 km/h and the airplane is 600 km/h.

2. The numbers are 4 and 8.

3. Elaine would take 7.5 hours.

4. a) $\frac{160}{x}+36+\frac{160}{x+0.7}=150$

 b) $570x^{2}-1201x-560=0, x=2.5 m/s$.

 c) The rate of ascent is$ 9 km/h$.

5. The plane's speed is 372 km/h in calm air.

6. The numbers are 3 and 4

7. The numbers are 5 and 6

8. There were 30 students who went on the trip.

9. It would take 6 hours to fill the pool with hose B.