Assignment: Add and Subtract Rational Expressions

the expression.

Choose any four (4) of the following five problems to solve. Show all work leading to your answer.

- 1. Randy drives his car to work each day. Suppose the expression $\frac{6}{x} + \frac{6}{3x}$ represents the total time it takes Randy to drive to work in a day, where *x* represents the average speed of the car in miles per hour, during the first part of the drive.
 - a. Use addition to simplify the expression $\frac{6}{x} + \frac{6}{3x}$. Show all the steps necessary to write the expression with a common denominator and to simplify the expression.
 - b. If the speed of the car was 24 mph during the first part of the drive, find the total amount of time it took Randy to drive to work that day.
- 2. Suppose the expression $\frac{325}{x} \frac{325}{x+15}$ represents the difference between the times, measured in hours, it took two moving trucks to drive 325 miles from one town to another, where *x* represents the average speed of the slower truck during the drive.

c. Use subtraction to simplify the expression $\frac{325}{x} - \frac{325}{x+15}$. Show all the steps necessary to write the expression with a common denominator and to simplify

d. If the slower truck drove at an average speed of 50 mph, find the difference between the driving times.

- 3. Two cement mixing trucks are scheduled to pour cement for the foundation of a new apartment building. Suppose the expression $\frac{100}{x} + \frac{100}{x+1}$ represents the total time expected for both trucks to complete the job, where *x* represents the rate in gallons per minute, at which the slower truck can pour concrete.
 - a. Use addition to simplify the expression $\frac{100}{x} + \frac{100}{x+1}$. Show all the steps necessary to write the expression with a common denominator and to simplify the expression.
 - b. If the slower truck can pour concrete at a rate of 24 gallons per minute, find the total amount of time it would take both cement mixing trucks to complete the job.
- 4. A cyclist had the wind at his back for part of his 25-mile ride, and then the wind died down for the remainder of the ride. Suppose the expression $\frac{15}{x+8} + \frac{10}{x}$ represents the total time it took the cyclist to complete his ride, where *x* represents the cyclist's average riding speed.
 - a. Use addition to simplify the expression $\frac{15}{x+8} + \frac{10}{x}$. Show all the steps necessary to write the expression with a common denominator and to simplify the expression.
 - b. If the cyclist's rides at an average speed of 10 miles per hour, find the total time it took to complete the ride.
- 5. A school of salmon swims 100 feet against the current in a river and then swims the same distance through a stretch of still water. Suppose the expression $\frac{100}{x-5} \frac{100}{x}$ represents the difference between the times it takes the salmon to swim against the current versus in the still water, where *x* represents the average speed of the salmon in still water.

- a. Use subtraction to simplify the expression $\frac{100}{x-5} \frac{100}{x}$. Show all the steps necessary to write the expression with a common denominator and to simplify the expression.
- b. Find the difference between the times if the average speed of the salmon is 20 feet per minute.