NAME _____ DATE _____ PERIOD _____

Lesson 5 Problem-Solving Practice

Solving Equations with Variables on Each Side

1. One hot air balloon is 15 meters above the ground, and is rising at a rate of 20 meters per minute. A second balloon is 195 meters above the ground, and is descending at a rate of 16 meters per minute. In how many minutes will the two balloons be at the same height?

2. A commuter train pulling 8 cars had room for another 84 passengers. Halfway through the commute, the train had to be taken out of service. All of the passengers were transferred to another commuter train that had 6 cars with the same capacity as those in the first train. After all of the passengers transferred to the replacement train, there was room for only 10 more passengers. What is the maximum number of passengers that each car can transport?

3. The table below shows what two rental companies charge for an intermediate 4-door sedan. How many miles must a driver drive in one day to make both options the same price?

	First Choice Car	Best Rent-A-Car
Daily charge	$65	$48
Cost per mile	$0.06	$0.10

4. Cindy is saving for a trip to Hawaii. Each week, she puts aside the same amount of money for her airfare. After 9 weeks of saving, she needs $390 more for her airfare. After 14 weeks, Cindy still needs $240. How much is the airfare to Hawaii? How much does Cindy put aside each week for her airfare?

5. Josh has two leaking pipes in his basement. While waiting for the plumber to come, Josh puts a bucket under each leak. The two buckets each hold the same amount of water. The bucket under the first leak fills in 20 minutes. The bucket under the second leak fills in 35 minutes. Josh's brother takes away one of the buckets and places the one bucket under the two leaks. About how long will it take for the one bucket to fill completely?

6. Refer to the information in Exercise 5. Josh wraps a cloth around the first leak, which cuts the rate of that leak in half. At the same time, it doubles the rate of the second leak. How will this affect the time it takes to fill the bucket?

Lesson 6 Problem-Solving Practice

Inequalities

1. The Texas Transportation Commission can establish a daytime speed limit of 75 miles per hour in counties with a population density of less than 10 persons per square mile. Write an inequality to describe the population density.

2. The front passenger seat of an SUV is equipped with weight sensors that determine the appropriate amount of deployment force of the air bag. If the weight on the front seat is less than 66 pounds, the air bag will not deploy. Write an inequality to show the minimum weight on the passenger seat that would lead to the deployment of the air bag.

3. An amusement park ride cannot safely restrain people under 50 inches tall or over 78 inches tall. Write two different inequalities that shows the safe height limits for riders.

4. One model of a forklift truck can raise a maximum of 1750 kilograms. Write an inequality to describe the maximum number of 40-kilogram boxes that this forklift truck can raise.

5. Agri-Crop sells a system that uses satellites to determine the appropriate amount of fertilizer to dispense on crops. The equipment for the system costs $6000. In addition, there is a yearly fee of $950 for signal reception. How much additional crop revenue would the system have to generate so that the investment is profitable for a farmer over a five-year period?

6. Refer to the information in Exercise 5. A representative from Agri-Corp estimates that the system would yield an additional $100 per acre each year of a certain crop. How large a farm should a farmer have in order to expect to make a profit using the system over a ten-year period?

Lesson 7 Problem-Solving Practice

Solving Inequalities

1. Gabrielle went to the movie theatre with her friends. She had $20.00 to spend. The movie ticket cost $6.25. Write an inequality to determine how much money she had to spend on snacks.

2. An adult female flea lays more than 25,000 eggs every month. What is the minimum number of eggs laid by an adult female flea in one week.
Let 1 month = 4 weeks.

3. The American Quarter Horse is the most popular riding horse in the world. The average weight of an American Quarter Horse at birth is 85 pounds. They grow to a maximum weight of 1300 pounds. Write and solve an inequality to find how many pounds an American Quarter Horse may gain from birth to adulthood.

4. A big league pitching coach tries to limit his pitchers to 110 pitches per game. If the pitcher has already thrown 52 pitches, write and solve an inequality to find how many more pitches he can throw before reaching the limit.

5. Winona Toy Company makes many kinds of toys. The table shows average production times.

Toy	Average Production Time (hours)
fire truck	2
train	$3\frac{1}{3}$
stuffed bear	$2\frac{1}{4}$
doll	4

Stella is a stuffed bear maker. She works 10 hours a day. Write and solve an inequality to determine the maximum number of bears Stella may make in a day.

6. Refer to the table in Exercise 5. Winona Toy company hopes to sell a lot of trains during the holiday season, so the managers hire another worker to make trains. What is the maximum number of trains that two workers can make in a 40-hour work week?

Lesson 8 Problem-Solving Practice

Solving Multi-Step Equations and Inequalities

1. In September 2010, the average price of gasoline was \$3.81 a gallon. This price represented an increase of \$2.31 less than twice the price the previous year. Use the equation $3.81 = 2x - 2.31$ to determine the price of gasoline in September 2009.

2. The length of one side of a regular hexagon is x. A regular pentagon also has a side length of x. A square is constructed with a side length of x. The total perimeter of all three figures in 105 centimeters. What is the length each side of the figures?

3. An excavation crew is digging a tunnel under a bay. The crew has dug 573 meters of the tunnel, which is 34 meters past the halfway point of the tunnel. What will be the length of the tunnel when the crew has finished digging?

4. A group of friends went on a three-day hike. During the second day of the hike, the group hiked twice as far as they did on the first day. On the third day, they hiked twelve miles farther than the combined distance of the first two days. In all, they hiked 24 miles. How far did they hike on the first day?

5. Nathan is interested in leasing a new car. He collected this information from two leasing companies.

Leasing Company	Monthly Payment	Mileage Limit	Extra Mileage Charge
ABC	\$463	10,000	\$0.25/mi
XYZ	\$473.50	12,000	\$0.10/mi

Nathan's drive to and from work each day is about 45 miles. If he goes to work about 226 days in a given year, what is the minimum amount he would have to pay in excess mileage if he leased from the ABC Leasing Company?

6. Refer to the table in Exercise 5. If Nathan leases a new car from XYZ Company, how many miles can he drive after work or on the weekend without being charged for excess mileage?