Rational "Work" Problems and Direct/Inverse Variation   Name: _____

1) Kevin can clean a large aquarium tank in about 7 hours. When Kevin and Lara work together, they can clean the tank in 4 hours. Write and solve a rational equation to determine how long, to the nearest tenth of an hour, it would take Lara to clean the tank if she works by herself.

2) A riverboat travels at an average of 14 km per hour in still water. The riverboat travels 110 km east up the Ohio River and 110 km down the same river in a total of 17.5 hours. To the nearest tenth of a kilometer per hour, what was the speed of the current of the river?

3) It takes 18 hours to fill a swimming pool using the small water pipe. It takes 12 hours to fill the same pool with the large water pipe. How long will it take to fill the pool if both pipes are used?

4) A glassblower can produce several sets of simple glasses in about 3 hours. When the glassblower works with an apprentice, the job takes about 2 hours. How long would it take the apprentice to make the same number of glasses when working alone?

5) If q varies inversely as x^2, and q = 9 when x = 2/3, find q when x = 5/4.

6) An egg is dropped from the roof of a building. The distance it falls varies directly with the square of the time it falls. If it takes ½ second for the egg to fall eight feet, how long will it take the egg to fall 200 feet?

7) The volume, V, of a gas kept at a constant temperature varies inversely as the pressure, p. If the pressure is 24 pounds per square inch, the volume is 15 cubic feet. What will be the volume when the pressure is 30 pounds per square inch?

8) The length of a violin string varies inversely as the frequency of its vibrations. A violin string 14 inches long vibrates at a frequency of 450 cycles per second. Find the frequency of a 12 inch violin string.

9) Determine whether the following points represent direct or indirect variation.

x	1	2	3	4
y	6	12	18	24