Exercise 5

Name _____

Solve these problems:

1.(a) You are conducting a study and participants must pass 2 screenings, first by a medical doctor and then by a psychiatrist, in order to be eligible. If the MD's reject one potential subject out of 12 and the psychiatrists reject 40% of remaining potential subjects, what percent of potential subjects make it past both screenings?

(b) If it costs $300 each time an MD examines a potential subject and $1200 each time a psychiatrist examines one, would it be cheaper to run the screenings the other way around?

2. "The top runners in the Boston Marathon cover the 26-mile distance in 2 hours and 15 minutes. If they average 12 miles per hour over the level part of the course but only 8 miles per hour in the infamous Heartbreak Hill area, how many of the 26 miles are level?"

(from Hughes-Hallett, *The Math Workshop: Algebra*)

3. Thermal pollution is a serious problem in American rivers. Water has a "heat content" equal to the product of its temperature and volume, and the temperature of a mixture can be found by dividing the sum of its heat contents by its total volume. A river has a flow of 100 million gallons per day and a normal temperature of 70 degrees F. What is the maximum volume of water at 130 degrees F that a nuclear power plant can be allowed to discharge into the river per day if a change in the river temperature of more than 8 degrees F will wreck the balance of the ecosystem?

(from Hughes-Hallett, *The Math Workshop: Algebra*)