Math 152 Ch. 8 and 9 Sample Test Name _____
Show all your work if you want to receive credit.

1. Solve the following by the addition/elimination method. $\begin{cases} 3x + 7y = 11 \\ 15x + 19y = 23 \end{cases}$

2. Solve the following by the substitution method. $\begin{cases} 2x + 3y = -2 \\ 3x + 4y = -2 \end{cases}$

3. Solve the following by either the addition or the substitution method.
   (a) $\begin{cases} 2.1x - 0.9y = 0.18 \\ -1.4x + 0.9y = 0.03 \end{cases}$
   (b) $\begin{cases} 2x - 6y = 15 \\ 12y - 4x = 1 \end{cases}$

4. The function given by $F(d) = \left(\frac{4.95}{d} - 4.50\right) \times 100$ can be used to estimate the body fat percentage $F(d)$ of a person with average body density d in kilograms per liter. A woman is considered obese if her body fat percentage is at least 32%. Find the body density of an obese woman.

5. Solve and graph the following. The answers should be written in interval notation.
   (a) $3 < 2x - 7 \leq 11$
   (b) $2x - 5 < 7$ and $3x + 1 > 21$
   (c) $2x - 5 < 1$ or $2x + 5 > 9$
   (d) $|3x - 2| > 4$
   (e) $|2x + 5| < -5$

6. Sketch the graph of the region bounded by the following. Be sure to label the vertices of the region.

$$\begin{cases} 3x + y \leq 12 \\ x + 3y \leq 12 \\ x \geq 0 \\ y \geq 0 \end{cases}$$

7. Set up the equations for the following word problems. You do not need to solve.
   (a) A technician is mixing some 80% solution and some 30% solution to make 150 gallons of a 62% solution. How many gallons of the original solutions are used?
   (b) The perimeter of a rectangular ocean front lot is 190 meters. The width is one-fourth of the length. What are the dimensions? Be sure to use l and w, not x and y.
   (c) A plane is flying 2553 miles from Los Angeles to Honolulu into a 60 mph headwind. If the speed of the plane in still air is 310 mph, how far from Los Angeles is the point of no return?
   (d) A business class divided an imaginary investment of \$80,000 into three mutual funds. The first fund grew by 10%, the second by 6% and the third by 15%. The total earnings for one year were \$8850. The earnings from the first fund were \$750 more than the earnings from the second fund. How much was invested in each fund?
   (e) Eric can be paid for his work in one of two ways:
   Plan A: \$3000 plus \$9.00 per hour
   Plan B: \$12.50 per hour
   Suppose that the job takes n hours. For what values of n is plan B better for Eric?