EXAM 1 - MATH 102 YOUR NAME:

Friday, February 18 George Voutsadakis

Read each problem **very carefully** before starting to solve it. Each problem is worth 10 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. (a) Line L_1 passes through the points (-2, 3) and (3, -12). Find its slope m_1 .

- (b) Line L_2 is perpendicular to line L_1 . What is its slope m_2 ?
- (c) If line L_2 passes through the point (5, 12), find an equation for L_2 .

(d) What is the *y*-intercept of L_2 ?

2. (a) Graph the solution set of the linear inequality in two variables $2y \ge x + 4$.

(b) Graph the solution set of the absolute value inequality $|2x - y| \le 4$.

3. The combined population of Northville and Southville in 2000 was 25000. By 2005, the population of Northville had increased by 10% and that of Southville by 15%. If the combined total population increased by 3073, what was the population of each city in 2000?

4. Solve the linear system of equations:

$$\begin{cases} 2x - y &= -8 \\ y + 3z &= 22 \\ x &- z &= -8 \end{cases}$$

5. (a) Calculate and simplify the expression

$$\frac{(-3x^3y^2)(-2xy^{-3})}{-9x^2y^{-5}}$$

(b) Calculate and write the result in scientific notation

$$\frac{(-4\cdot 10^5)(6\cdot 10^{-9})}{2\cdot 10^{-16}}$$