1. (20 pts) Find the solution set:
   a) 6x − 2(x + 3) = 5(x − 1) + 4
   b) 2|3x − 1| − 3 = 7

2. (10 pts) Graph the solution set to the inequality 2x − 3y > 12.

3. (20 pts) Solve the inequality, express the solution set in interval notation and graph the solution set on a number line.
   a) −1 ≤ 2x + 3 < 7
   b) |3x − 1| < 7

4. (13 pts) You want to mix a 45% alcohol solution with a 5% alcohol solution to get 100 liters of a mixture that is 11% alcohol. How much of each should you use?

5. (10 pts) Let f(x) = x^2 − x − 1 and find f(a + h). Simplify your answer.

6. (12 pts) Find the slope intercept form of the equation for the line parallel to 2x − 5y = 6 with the same y-intercept as 4y = 9x + 20.

7. (20 pts) Find the solution to the system of equations.
   a) Use Cramer’s Rule: 5x + 3y = 2
      2x − 3y = 3
   b) Use Any Method: 2x − y = 6
      −9x + 2y = 3

8. (10 pts) Simplify \( \left( x^{-5} \left( x^{-3} \right)^2 \right)^{-4} \) as much as possible and leave your answer with only positive exponents.

9. (10 pts) Find the vertex and intercepts for the parabola given by the quadratic function \( f(x) = x^2 − 4x + 3 \).

10. (10 pts) Perform the indicated operation and leave your answer as simple as possible. \( \left( 2x + 3y^2 \right) \left( 4x^2 − 6xy^2 + 9y^4 \right) \)

11. (20 pts) Factor completely:
   a) 8x^3y − 18xy
   b) 8x^3 − 27

12. (20 pts) Solve the equation by factoring
   a) \((x + 1)(x − 5) = 7\)
   b) \(x^2(3x − 2) = x\)