

1. (20 pts) Find the solution set:
 - a) $6x - 2(x - 3) = 4(x + 1) + 4$
 - b) $2|3x + 1| - 5 = 9$

2. (10 pts) Graph the solution set to the inequality $2x + 5y < 10$.

3. (20 pts) Solve the inequality, express the solution set in interval notation and graph the solution set on a number line.
 - a) $-9 \leq 2x - 3 < 5$
 - b) $|3x - 1| > 4$

4. (13 pts) You want to mix a 50% alcohol solution with a 5% alcohol solution to get 100 liters of a mixture that is 14% 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 $5x - 3y = 6$ with the same y-intercept as $4y = 7x + 16$.

7. (20 pts) Find the solution to the system of equations.
 - a) Use **Cramer's Rule**:

$$\begin{array}{r} 7x + 5y = 2 \\ 6x - 3y = 3 \end{array}$$
 - b) Use **Any Method**:

$$\begin{array}{r} 2x - y = 6 \\ -5x + 4y = 3 \end{array}$$

8. (10 pts) Simplify $\left(x^{-4} (x^3)^{-2}\right)^{-4}$ 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 $f(x) = x^2 - 2x - 3$.

10. (10 pts) Perform the indicated operation and leave your answer as simple as possible.

$$(3x + 2y^2)(9x^2 - 6xy^2 + 4y^4)$$

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

12. (20 pts) Solve the equation by factoring
 - a) $(x - 1)(x + 4) = 24$
 - b) $x^2(5x + 3) = 26x$