

# FINAL EXAM ANSWERS

1. Solve each inequality. State the solution set using interval notation, and graph it on a number line.

(a)  $[-6, 4)$

(b)  $(-\infty, -2) \cup (5, \infty)$

(c)  $[0, \frac{2}{3}]$

(d)  $(\infty, -2] \cup [2, 3]$

2. Reduce the fraction

$$\frac{x^{1/2}}{y^{4/3}}$$

3. Solve each quadratic and state the solution set, including complex solutions. You may use any method except the quadratic formula. Complex solutions should be written using  $i$ ; radicals should be simplified.

(a)  $\{\pm 2\sqrt{3}\}$

(b)  $\{-3 \pm 2i\}$

4. Solve and state the solution set. You may use any method to solve quadratic equations you encounter, including the quadratic formula. Check for extraneous solutions to receive full credit.

(a)  $\{4\}$

(b)  $\{-4, 12\}$

(c)  $\{3, -2\}$

5. Using a graph, find the solution set for the system of equations

$$3x - 3y = 9$$

$$5y - 5x = 10.$$

Parallel lines, so it's inconsistent.

Solution set:  $\emptyset$

6. (6 pts) Graph the solution set to the system of inequalities  $x - 4y < 0$  and  $3x + 2y \geq 6$  on the axes provided. Clearly indicate which region is the solution set.
7. Determine the solution set to each system of equations. Classify each system as independent, dependent, or inconsistent.

- (a)  $\{(\frac{3}{4}, -\frac{1}{2})\}$  – independent.  
(b)  $\{(x, y) | 3x - 2y = 12\}$  – dependent.

8. Simplify the complex fraction

$$\frac{-y^2 - 12}{y^2 - 3}$$

9.  $-x^2 + 3x - 10 + \frac{32}{x+3}$ .

10. Set up an equation for the following word problem, but *do not solve it*:

Homer can row his boat 17 miles in the same time it takes Marge to cover 42 miles in her motorboat. If Marge's boat travels 15 mph faster than Homer's, how fast is Homer rowing his boat? (Stop once you have the equation to solve!)

$$17(x + 5) = 42x$$

11. Perform the indicated operations. Your final answers must be a single fraction in lowest terms.

(a)  $\frac{10 + 7ay + 12xy}{6xy}$

(b)  $\frac{(x - 2)}{3(x + 1)}$