

# FINAL EXAM ANSWERS

1. Simplify each expression. All exponents should be positive, all denominators should be rationalized, all radicals should be simplified, and all complex numbers should be in the form  $a + bi$ .

(a) 9

(c)  $-3\sqrt{2} - 2\sqrt{5}$

(b)  $\frac{x^{2/3}z}{y^{5/3}}$

(d)  $\frac{3y^2i\sqrt{2y}}{2}$

2.  $x^2 + x - 3 + \frac{-3x+7}{x^2+3}$

3. Perform the indicated operations, and express your answer in its simplest form (i.e., all fractions should be reduced).

(a)  $-\frac{2}{3}$

(b)  $\frac{-2z - 4}{(z + 1)^2}$

4.  $\frac{27\sqrt{2}}{4}$

5. Simplify the following complex fractions. You can leave common denominators in factored form (i.e., don't bother multiplying out denominators).

(a)  $\frac{3x + 3}{-2x - 18}$

(b)  $\frac{y^6z + z^6}{y^5z^5 - y^7}$

6.  $\{(2, -\frac{1}{3})\}$  – independent.

7. Solve each quadratic by factoring or completing the square, and state the solution set (including complex solutions). You may use the quadratic formula to check your answers, but you will not get credit for using it to solve.

(a)  $\left\{ \frac{3 \pm i\sqrt{7}}{4} \right\}$

(b)  $\{0, 5\}$

8. Solve each equation. State the solution set for each.

(a)  $\{2\}$

(b)  $\{2, -1\}$

(c)  $\{2 \pm 2\sqrt{2}\}$

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

(a)  $[-3, \frac{19}{3})$

(b)  $(-\infty, \infty)$

10. (4 pts) Graph the solution set to the system of inequalities  $3x + 2y \geq 8$  and  $3x - 2y < 6$  on the axes provided.

11. Parallel lines, so the system is inconsistent.

Solution set:  $\emptyset$

12.  $\frac{36}{5}$ , or 7.2 hours

13.  $y = -\frac{1}{2}x + \frac{7}{2}$ , and  $2y + x = 7$ .