HOMEWORK 9 - MATH 102 DUE DATE: Monday, December 3 INSTRUCTOR: George Voutsadakis

Read each problem **very carefully** before starting to solve it. Four out of the eight problems will be chosen at random and graded. Each problem graded is worth 3 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points.

GOOD LUCK!!

1. Rationalize the denominators:

(a)
$$\sqrt{\frac{7}{32ab}}$$

(b) $\sqrt[3]{\frac{3}{9x^6}}$

- 2. Add, subtract, or multiply, as appropriate:
 - (a) $\sqrt{75} + 7\sqrt{12}$
 - (b) $\sqrt[3]{24} \sqrt[3]{81}$
 - (c) $(3\sqrt{6} 4\sqrt{3})(4\sqrt{6} + 7\sqrt{3})$
- 3. Rationalize the denominators:

(a)
$$\frac{2+\sqrt{5}}{\sqrt{3}}$$
 (b) $\frac{6}{5-\sqrt{2}}$

4. Solve the following radical equations:

(a)
$$\sqrt{x-5} - x = -7$$

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

5. Perform the indicated operations with complex numbers:

(a)
$$(3 + \sqrt{-4}) - (5 - \sqrt{-9})$$

(b) $\sqrt{-9}(2 + 5i)$
(c) $\frac{5+3i}{7-3i}$

- 6. Solve the following quadratic equations by completing the square:
 - (a) $x^2 10x + 24 = 0$ (b) $2x^2 + 3 = 6x$
 - (c) $2x^2 + 12x + 18 = 27$
- 7. Use the quadratic formula to solve the equations:
 - (a) $x^2 4x = 12$ (b) $6x - 9x^2 - 4$

(b)
$$6x = 9x^2 - 4$$

- (c) $\frac{x^2}{12} = -\frac{x}{4} \frac{1}{3}$
- 8. Determine the value of k that will make the following equation have exactly one rational solution:
 - (a) $2kx^2 12x = -9$
 - (b) $4x^2 + 9kx = -1$