

Name:

MAC1105 Section 1A26
Exam 3 Review (NOT FOR A GRADE)

Please show all of your work in a NEAT and ORGANIZED fashion.

1. The area of a rectangle is 30 square meters. Its width is 11 meters more than twice its length. Find the length and width of the rectangle.

2. A square has an area that is numerically 48 more than twice its perimeter. What is the length of a side? (The side length is measured in inches.)

3. A rocket is launched from the ground with an initial velocity of 64 feet per second. Its height in feet t seconds after launch is given by

$$s = -16t^2 + 64t$$

- (a) Find the time(s) that the rocket will reach a height of 48 feet.
- (b) Find the time(s) that the rocket will return to the ground.

4. Perform the operations and write your answer in standard form. Simplify any radicals **completely**.

$$\frac{\sqrt{-30} \cdot \sqrt{-5}}{\sqrt{-10}}$$

5. Write in standard form $a + bi$ and simplify and fractions **completely**.

$$\frac{3 + \sqrt{-9}}{-9}$$

6. Simplify.

$$(10 + 2i) + 2(-3 + 4i)$$

7. Multiply and write your answer in standard form $a + bi$.

$$(5 + 2i)(-6 - i)$$

8. Divide and write your answer in standard form $a + bi$.

$$\frac{1 + i}{-3 - 4i}$$

9. Simplify.

$$\frac{1}{i-43}$$

10. Solve the quadratic equation by completing the square.

$$2x^2 - 20x + 68 = 0$$

11. Evaluate the discriminant of the quadratic equation. Use the value of the discriminant to determine whether the quadratic equation has 2 real solutions, 1 repeated real solution, or 2 nonreal complex solutions.

$$4x^2 - 3x - 3 = 0$$

12. Solve the equation.

$$\frac{3}{x-1} + \frac{2}{x+5} = \frac{x^2-1}{x^2+4x-5}$$

13. Solve the equation.

$$\sqrt{x+11} - x + 1 = 0$$

14. Solve the equation.

$$|5x-3| = 10$$

15. Solve the equation.

$$|3x^2 - 5x - 2| = 0$$

16. Solve the inequality and write the solution set in interval notation.

$$2(x + 6) + 4(-x + 1) > x$$

17. Solve the inequality and write the solution set in interval notation.

$$2 < \frac{1}{5}x + 7 \leq 5$$

18. Solve the inequality and write the solution set in interval notation.

$$6x^2 + x - 10 \leq 2$$