

NAME: \_\_\_\_\_ Score \_\_\_\_\_ /100  
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SHOW ALL YOUR WORK IN A NEAT AND ORGANIZED FASHION

Circle T or F, whichever is correct. Questions 1 – 25 are each worth 2 points.

1. T F The x-intercepts of a graph are found by setting x equal to zero and solving for y.
2. T F The y-intercepts of a graph are found by setting x equal to zero and solving for y.
3. T F  $ax^2 + bx + c = 0$  is the quadratic formula.
4. T F The opposite of the complex number  $5 - 7i$  is  $5 + 7i$ .
5. T F The equation of the circle with center at the origin and radius r is  $x^2 + y^2 = r^2$
6. T F If the slope of a line is 4 and the slope of another line is  $-4$ , the lines are perpendicular.
7. T F The distance between  $(-4, 5)$  and  $(3, -1)$  is  $\sqrt{(3+4)^2 + (-1-5)^2}$
8. T F  $y - y_1 = m(x - x_1)$  is the equation of a line.
9. T F The graph of  $y - 3x^2 = 5x + 1$  is a parabola which opens down.
10. T F Two equations are equal if they have the same solution sets.
11. T F The sum of  $(3 + 2i)$  and  $(4 - 7i)$  is  $12 - 14i^2$
12. T F The conjugate of  $3i$  is  $-3i$
13. T F  $(x + y)^2 = x^2 + y^2$
14. T F If both sides of an equation are squared the resulting equation is equivalent to the original
15. T F If a, b, and x are real numbers such that  $a < x < b$ , then it must be true that  $a < b$ .
16. Note that solution is not the correct response. The \_\_\_\_\_ of an equation consists of all the points, and only those points, which are solutions of the equation.
17. A linear equation in one variable is an equation which may be written as \_\_\_\_\_
18. A linear equation in two variables is an equation which may be written as \_\_\_\_\_
19. A quadratic equation in one variable is an equation which may be written as \_\_\_\_\_
20. A quadratic equation in two variables is an equation which may be written as \_\_\_\_\_
21. A simplest equation is an equation which has a single \_\_\_\_\_ on one side of the equal sign and a single \_\_\_\_\_ on the other side of the equal sign.
22. If k is a positive real number then the principle square root of its opposite  $-k$  is defined by  $\sqrt{-k} =$  \_\_\_\_\_

23. Assume that  $a$ ,  $b$  and  $c$  are real numbers such that the solution to  $|ax - b| < c$  is  $(3, 7)$ . Then the solution to  $|ax - b| > c$  is \_\_\_\_\_
24. Assume that  $a$ ,  $b$  and  $c$  are real numbers such that the solution to  $|ax - b| < c$  is  $(3, 7)$ . Then the solution to  $|ax - b| = c$  is \_\_\_\_\_. **Note the solution set for  $|ax - b| = c$  is  $\{3, 7\}$**
25. The slope intercept form of the equation of a line is \_\_\_\_\_

**Questions 26 – 42 are each worth three points.**

26. **You are not expected to solve the equation.** Show that  $-1$  is not a solution of  $x^4 - 5x^3 = 17$  **Show your work.**

27. Write the equation whose graph is the circle with center  $(t, p)$  and radius  $g$ .

28. Write the formula for the volume of a cylinder.

29. Write the quadratic formula.

30. Write the norm of  $7 - 3i$ .

31. Write the complex number  $4 + \sqrt{-5}$  in standard form  $a + bi$ .

32. Write the conjugate of  $-12 - 5i$ .

33. Write the multiplicative inverse of  $9 - 2i$ .

34. What is the midpoint of the line segment joining  $(-1, 3)$  and  $(5, 5)$ ? **Show your work.**

35. Write the equation of the line through  $(2, 3)$  with slope 7 in slope-intercept form. **Show your work.**

36. Solve the inequality  $|4x - 3| < 11$ . Write the solution set in interval notation. **Show your work.**

37. Solve  $6x + ax = 2x + 5$  for  $x$ . **Show your work.**

38. Solve the equation  $x = \sqrt{-5x - 6}$  **Show your work.**

39. A rectangular room is twice as long as it is wide, and its perimeter is 84 feet. What are its dimensions ? **Show your work.**

40. **If you don't have a calculator, write your answer as a fraction reduced to lowest terms.** 52 is 14% of what number. **Show your work.**

41. To solve the equation  $\sqrt{3x-4} = \sqrt{x^2+3}$  we square both sides to obtain  $3x-4 = x^2+3$ . What is the relation between the solution set for  $\sqrt{3x-4} = \sqrt{x^2+3}$  and the solution set for  $3x-4 = x^2+3$ ?

42. What are the x-intercepts of the graph of the equation  $y = (x-4)(3x+5)$ ? **Show your work.**