

NAME: _____ Score _____ /100
Please print

SHOW ALL YOUR WORK IN A NEAT AND ORGANIZED FASHION. NO WORK – NO CREDIT

Circle T or F, whichever is correct.

2 pts. each for 1 – 25. 4 pts. each for all others.

1. T F Every integer is a rational number.
2. T F Every equation has a solution.
3. T F Every conditional equation has a solution
4. T F 3 is a solution of $x^3 + x^2 - x = 30$
5. T F If both sides of an equation are multiplied by $3x - 4$, the resulting equation is equivalent to the original equation.

Circle the symbol for the smallest set of numbers which contains the number given at the left.

The Symbols are standard: **C** is the complex numbers, **R** is the real numbers, **F** is the irrational numbers, **Q** is the rational numbers, **Z** is the integers, **W** is the whole numbers, and **N** is the natural numbers.

6. The smallest set which contains $\sqrt{8} - 3$ is **C R F Q Z W N**
7. The smallest set which contains $\frac{2}{5} - 7i$ is **C R F Q Z W N**
8. The smallest set which contains $\frac{8}{3}$ is **C R F Q Z W N**
9. The smallest set which contains 17 is **C R F Q Z W N**
10. The smallest set which contains $7i$ is **C R F Q Z W N**
11. The smallest set which contains $\sqrt{3} + \frac{3}{5}i$ is **C R F Q Z W N**

Fill in each of the blanks to make the statements true.

12. The distance d between two points (x_1, y_1) and (x_2, y_2) is given by the

formula: _____

13. If the number 3 makes a particular equation true and 5 makes that same equation false, then that equation is a _____ equation.

14. Two equations are _____ if they have the same solution sets.

15. The graph of an equation consists of all the points, and only those points, whose coordinates are _____ of the equation.
16. If any _____ is added to both sides of an equation the resulting equation is equivalent to the original equation.
17. A linear equation in one variable is an equation that can be written in the form _____ where a and b are real numbers with a not zero.
18. The formula for the area of a triangle with base b and height h is _____.
19. The conjugate of a complex number $a + bi$ is _____.
20. The multiplicative inverse of a complex number $a + bi$ is its _____ divided by its _____.

Circle **all** the words which could be used to correctly complete the sentence.

21. $2x - 7 = 0$ is a (linear quadratic identity conditional contradiction) equation.
22. $2x - 5 = 2x + 3$ is a (linear quadratic identity conditional contradiction) equation.
23. $(x+2)(x + 5) = x^2 + 7x + 10$ is a (linear quadratic identity conditional contradiction) equation.
24. $3x^2 + 4x = 3x + 2$ is a (linear quadratic identity conditional contradiction) equation.
25. Complete the statement of the Transitive Property.
If a, b, and c are real numbers such that $a = b$ and $b = c$, then _____
26. Compute the sum $(3 - 2i) + (7 + 4i)$. **Show the steps.**

27. Compute the product $(2 + 5i)(4 - 2i)$. **Show the steps.**

28. Change $(2 + 5i) \div (4 - 2i)$ to the equivalent division problem.

29. Solve $3x - 8 = 5x + 7$. **Show the steps.**

30. Use the Quadratic formula to solve $3x^2 - 3x - 4 = 0$ **Show the steps.**

31. Calculate the distance between the points $(5, 3)$ and $(2, 9)$.

32. Sketch the graph of $\{x \mid 1 < x \leq 6\}$

33. Consider the following process for solving $3x^2 - 7x = 6$:

Eq.1 $3x^2 - 7x = 6$

Eq.2 $3x^2 - 7x - 6 = 0$

Eq.3 $(3x + 2)(x - 3) = 0$

Eq.4 $3x + 2 = 0$ OR $x - 3 = 0$

Eq.5 $3x = -2$ OR $x - 3 = 0$

Eq.6 $x = -\frac{2}{3}$ OR $x = 3$

Eq.7 The solution set for the original equation is $\{3, -\frac{2}{3}\}$.

Now answer the following four questions about the above process.

33a. State the property which assures us that Eq.1 is equivalent to Eq.2 _____

33b. State the property which assures us that Eq.3 is equivalent to the two equations joined with OR in Eq.4

33c. State the property which assures us the first equation in Eq.5 is equivalent to the first equation in Eq.6

33d. The equations in Eq.6 are called _____ equations.

34. Solve the equation $\sqrt{2x - 1} = x - 2$

I will help you by providing some of the steps. You are to supply the others.

$\sqrt{2x - 1} = x - 2$ (I will square both sides)

$2x - 1 = x^2 - 4x + 4$

This second equation is not equivalent to the first equation. However, the solution set for the second

equation _____

Now I will add $-2x + 1$ to both sides of the second equation to obtain

$x^2 - 6x + 5 = 0$ (You can take it from here. Finish solving the equation. Find the solution set.)

35. Find all values of x satisfying the following conditions.

$$y_1 = x - 3 \quad y_2 = x + 8 \quad y_1 y_2 = -30$$

36. Consider the formula $S = \frac{C}{1 - r}$. Solve for r .

38. The length of a football field is 200 feet more than the width. The perimeter of the field is 1040 feet. What are its dimensions?