Math 129 - Test 1

Name _____

September 24, 2020

Score _____

Show all work to receive full credit. Supply explanations where necessary.

1. (2 points [3]) Give an example of a linear equation that involves the variable x.

2. (2 points [3]) Give an example of an equation that is NOT linear.

3. (3 points [3]) Solve for r: $2.6(r + 1.5) = 1.1r$

4. (3 points [3]) Solve for w: $2w + 4 - 3(-2w - 2) = 4(w - 1)$

5. (3 points [3]) Solve for x: $5\left(-x + \frac{1}{7}\right) = x + \frac{5}{7} - 6x$

6. (3 points [3]) Let x be the smallest of three consecutive whole numbers. Write an algebraic expression for the sum of the three numbers. (Your final answer should contain only one variable, x.)

7. (4 points [3]) Solve for t. Write your solution set in interval notation, and graph it on a number line.

$$5t + 13(t - 1) \leq -3(2 - 4t)$$

8. (6 points [3]) Solve for x. Write your solution set in interval notation, and graph it on a number line.

$$-25 \geq -5(x + 2) \quad \text{and} \quad x < \frac{1}{2}(x + 6)$$

9. (2 points [3]) Write an inequality to represent the following situation.

   On the interstate, you cannot drive slower than 45 mph and you cannot drive faster than 70 mph. Use x to represent the speed (in mph) that you can drive.

10. (3 points [3]) Solve for u: $8u + 2(9 - 6u) > -6(u + 3) + 2(u + 1)$

11. (4 points [11]) Solve for x: $-6|2x - 7| = -12$

12. (3 points [11]) Solve for y: $13 - |25y + 32| = 75$

13. (6 points [11]) Solve for x. Write your solution set in interval notation, and graph it on a number line.

$$|-5-2x|+4>13$$

14. (4 points [7,12]) Write as a complex number in standard form: $2(i+7)+(3+2i)(5-i)$

15. (3 points [7,12]) Simplify i^{115}. Show your work.

16. (3 points [7]) Solve for x: $2(3x-5)(x+9)=0$

17. (4 points [7]) Solve for x: $x^2 - 4x = 21$

18. (4 points [7]) Find all values of j for which the equation $8x^2 + 9x + j = 0$ has no real solutions. Write your answer as an equality or inequality in terms of j.

19. (4 points [7]) Solve for x: $(3x - 2)^2 = 49$

20. (8 points [7]) Solve for x. Write your solution(s) in exact form, simplified as much as possible.

$$4x^2 - 8x + 7 = 0$$

21. (5 points [7]) A ball is thrown from a height of 82 meters with an initial downward velocity of 4.5 meters per second. The height of the ball (in meters) after t seconds is given by $h = 82 - 4.5t - 4.9t^2$. When does the ball hit the ground? Round your answer to the nearest hundredth.

22. (3 points [7]) Compute the discriminant and say what it tells you about the solutions.

$$4x^2 - 17x + 10 = 0$$

23. (3 points [1,11]) Determine the values of w that are restricted from the following expression: $\dfrac{w-1}{w^2-2w-3}$.

24. (4 points [3,7,11]) Solve for x: $\dfrac{30}{x+3} = \dfrac{21}{x}$

25. (7 points [3,7,11]) Solve for u: $\dfrac{2}{(u-1)(u-2)} = 3 + \dfrac{2}{u-2}$

26. (4 points [11]) Solve for x. Round your answer(s) to the nearest hundredth.

$$(2x-5)^3 - 28 = 1$$