

Math 129 - Test 1
February 18, 2021

Name _____

Score _____

Show all work to receive full credit. Supply explanations where necessary. Unless otherwise indicated, write all answers in exact form, simplified as much as possible.

1. (4 points [3]) Which of these equations ARE NOT linear equations? Circle all that apply.

$$\frac{3x + 5}{x} = 4, \quad \sqrt{x + 1} = 9, \quad (x - 6)^3 = 8, \quad \frac{2}{7} - \frac{x}{5} = 3(x + 1)$$

2. (3 points [3]) Solve for y : $\frac{1}{8}y + \frac{5}{4} = \frac{1}{3}$

3. (3 points [3]) Solve for x : $-5(4x - 4) + 7x = 3(x + 4)$

4. (4 points [3]) Write an algebraic equation using the variable x to represent the following problem situation: *Six less than twice a number is the same as half of the number.*

5. (3 points [3]) Solve for w : $\frac{1}{2}(2w - 8) + 3w = 4(w - 1)$

6. (5 points [3]) Solve for x . Write your solution set in interval notation, and graph it on a number line.

$$5(x - 1) + 3x \leq 6x - 2$$

7. (5 points [3]) Solve for u . Write your solution set in interval notation, and graph it on a number line.

$$-8u + 5 < 21$$

8. (3 points [3]) Solve for r : $3(r - 6) - (r - 18) < 2(r - 1) + 2$

9. (6 points [3]) Solve for x . Write your solution set in interval notation, and graph it on a number line.

$$1 + 4(x + 1) \geq 5 \quad \text{or} \quad x - 3 > 5 - x$$

10. (4 points [3]) Write an algebraic inequality that describes the shaded region on the number line shown below.



11. (3 points [11]) Solve for t : $2|t - 5| + 6 = 2$

12. (3 points [11]) Solve for w : $|2w - 3| = 9$

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

$$|5 - x| + 2 \leq 12$$

14. (4 points [7,12]) Write as a complex number in standard form: $i(5 + 3i)(1 - 2i)$

15. (3 points [7,12]) Write as a complex number in standard form: $\frac{1}{4 + i}$

16. (4 points [7]) Solve for x : $(2x + 7)^2 = 49$

17. (3 points [7]) Solve for x : $-3(5x - 2)(x - 7) = 0$

18. (4 points [7]) Solve for v : $4v^2 + 7v = -3$

19. (5 points [7]) Solve for x . Write your solution(s) in exact form, simplified as much as possible.

$$3x^2 + 3x + 7 = 0$$

20. (3 points [7]) Use the discriminant to determine a value for b so that the equation has exactly one real solution.

$$4x^2 + bx + 3 = 0$$

21. (5 points [7]) A ball is thrown from a height of 20 meters with an initial upward velocity of 4 meters per second. The height of the ball (in meters) after t seconds is given by $h = 20 + 4t - 4.9t^2$. When does the ball hit the ground? Round your answer to the nearest hundredth.

22. (4 points [11]) Solve for x . Round your answer(s) to the nearest hundredth.

$$(2x + 5)^3 + 25 = 0$$

23. (3 points [1,11]) Determine the values of t that are restricted from the following expression: $\frac{t^2 + 3t - 18}{t^2 + 15t + 54}$

24. (4 points [3,7,11]) Solve for u : $\frac{1}{u - 5} = \frac{2}{3u - 15}$

25. (6 points [3,7,11]) Solve for x : $1 + \frac{2}{x - 4} = \frac{5}{4x - 16}$