Math 129 - Test 1

Name _____

September 19, 2019

Score _____

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

1. (2 points [3]) Which one of these equations IS A LINEAR EQUATION?

$$3x - 2 = 3\sqrt{x} - 7, \qquad 8(x+2) = 7(x-5) + x^2, \qquad \frac{x}{5} + \frac{3}{7} = x, \qquad 5x + \frac{5}{x} = 5$$

2. (3 points [3]) Solve for v: $3(v+2) + v = 4(v-1) + 12$

3. (3 points [3]) Solve for t: $\dfrac{-2t + 18}{6} = 1$

4. (3 points [3]) Solve for y: $-3(y+5) + 5y = 3y + 10 - (y + 25)$

5. (4 points [3]) When walking, Oscar burns 96 calories per mile and Emma burns 64 calories per mile. One day the two of them walk a total of 8 miles. Let x represent the number of miles walked by Oscar. Write an algebraic expression for the total number of calories burned by the two of them. (Your final answer should contain only the variable x.)

6. (4 points [3]) Solve for x. Write your solution set in interval notation, and graph it on a number line.

$$13 < -5x - 17$$

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

$$9y - 22 \geq -2(2 - 6y)$$

8. (3 points [3]) Solve for y: $2(5-y)+2y>7$

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

$$30 \leq -5(x-3) \quad \text{or} \quad \frac{3}{2}x \geq x+1$$

10. (4 points [3]) Tess has \$30 and she wants to go to the fair. It costs \$10 for admission and \$1.50 per ride. Let r represent the number of rides that Tess will purchase. Write an inequality involving r that Tess could solve to determine the numbers of rides she can afford.

11. (4 points [11]) Solve for x: $-2|3x-7|=-12$

12. (2 points [11]) What is wrong with saying that the equation $|2x+1|=-3$ means the same as $2x+1=\pm 3$?

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

$$|10 - 4x| \leq 6$$

14. (4 points [7,12]) Write as a complex number in standard form: $\dfrac{6 - 5i}{3 - 2i}$

15. (3 points [7,12]) Write as a complex number in standard form: $i^6 + i^9 + i^{12}$

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

17. (4 points [7]) Solve for x: $x^2 - 30 = x$

18. (4 points [7]) Solve for x: $6x^2 + x - 1 = 0$

19. (3 points [6]) What number must be added to both sides of the following equation so that the left hand side is a complete square?

$$x^2 + 3x = 2$$

20. (2 points [7]) Suppose you correctly solved a quadratic equation, and you found that it has two complex conjugate solutions. What can you say about the value of the discriminant?

21. (5 points [7]) Solve for x. Write your solution(s) in exact form, simplified as much as possible.

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

22. (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.

23. (3 points [7]) Use the discriminant to determine a value for b so that the equation has exactly one real solution.

$$x^2 + bx + 16 = 0$$

24. (3 points [1,11]) Ashanti solved the equation $\dfrac{r}{r-4} = \dfrac{4}{r-4} - \dfrac{4}{5}$ and found that $r = 4$. She then immediately concluded that there is no solution. Why did she make that conclusion?

25. (4 points [3,7,11]) Solve for x: $\dfrac{10}{x} = \dfrac{18}{x-4}$

26. (5 points [3,7,11]) Solve for u: $\dfrac{2}{(u-1)(u-2)} = 3 + \dfrac{2}{u-2}$

27. (4 points [11]) Solve for x. Round your answer(s) to the nearest hundredth.

$$(3x+2)^3 - 18 = 0$$