

Math 129 - Test 1
September 18, 2019

Name key 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?

$$3x - 2 = 3\sqrt{x} - 7,$$

↑
RADICAL

$$8(x + 2) = 7(x = 5) + x^2,$$

↑
QUADRATIC

$$\frac{x}{5} + \frac{3}{7} = x,$$

↑
LINEAR

$$5x + \frac{5}{x} = 5$$

↑
RATIONAL

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

$$3v + 6 + v = 4v - 4 + 12$$

$$4v + 6 = 4v + 8$$

$$6 = 8$$

CONTRADICTION.

No solution

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

$$-2t + 18 = 6$$

$$-2t = -12$$

$$t = 6$$

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

$$-3y - 15 + 5y = 3y + 10 - y - 25$$

$$2y - 15 = 2y - 15$$

IDENTITY.

All numbers are solutions.

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 .)

OSCAR WALKS x MILES
 MEANS EMMA WALKS $8-x$ MILES

OSCAR'S CALORIES + EMMA'S CALORIES
 = TOTAL

$$96x + 64(8-x) = \text{TOTAL CALORIES}$$

OR

$$32x + 512 = \text{TOTAL}$$

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

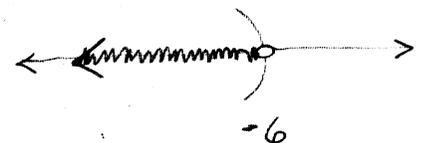
$$13 < -5x - 17$$

$$30 < -5x$$

$$-6 > x$$

$$x < -6$$

$$(-\infty, -6)$$



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

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

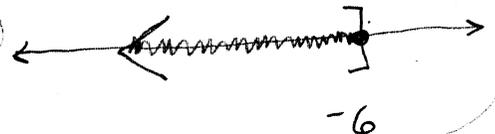
$$9y - 22 \geq -4 + 12y$$

$$-18 \geq 3y$$

$$-6 \geq y$$

$$y \leq -6$$

$$(-\infty, -6]$$



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

$$10 - 2y + 2y > 7$$

$$10 > 7 \text{ Always True!}$$

ALL #s ARE SOLUTIONS.

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

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

$$30 \leq -5x + 15$$

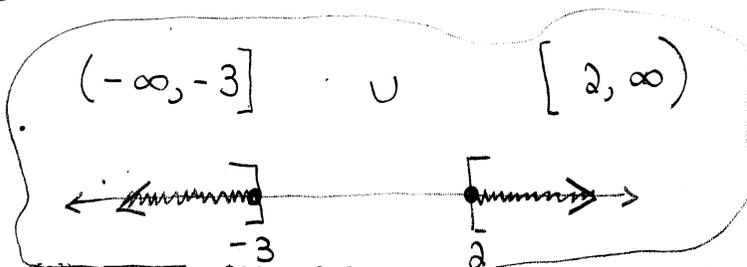
$$15 \leq -5x$$

$$-3 \geq x$$

$$3x \geq 2x + 2$$

or

$$x \geq 2$$



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.

$$1.5r + 10 \leq 30$$

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

$$|3x - 7| = 6$$

$$3x - 7 = 6 \text{ or } 3x - 7 = -6$$

$$3x = 13$$

$$x = 13/3$$

or

$$3x = 1$$

$$x = 1/3$$

$$x = \frac{13}{3} \text{ or}$$

$$x = \frac{1}{3}$$

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

AN ABSOLUTE VALUE CANNOT BE NEGATIVE. WRITING $2x + 1 = \pm 3$ IS APPLYING A PROCEDURE THAT DOES NOT APPLY.

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

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

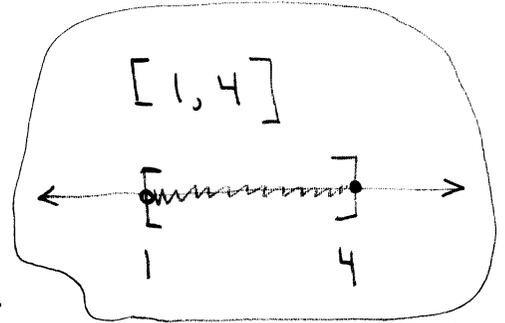
$$-6 \leq 10 - 4x \leq 6$$

$$-16 \leq -4x \leq -4$$

$$4 \geq x \geq 1$$

or

$$1 \leq x \leq 4$$



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

$$\frac{(6-5i)(3+2i)}{9+4} = \frac{18-3i-10i^2}{13} = \frac{28-3i}{13}$$

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

$$i^6 = (i^2)^3 = -1$$

$$i^9 = i^4 \cdot i^4 \cdot i = i$$

$$i^{12} = (i^4)^3 = 1$$

$$\text{So, } i^6 + i^9 + i^{12}$$

$$= -1 + i + 1 = i$$

$$= i$$

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

$$x-7=0 \text{ or } 5x+3=0$$

$$x=7 \text{ or } x=-3/5$$

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

$$x^2 - x - 30 = 0$$

$$(x-6)(x+5) = 0$$

$$x-6=0 \text{ or } x+5=0$$

$$x=6 \text{ or } x=-5$$