Unit 4: Equalities Practice Test

Math 9 Principles

Name: _____ Block: ____

Please initial this box to indicate you carefully read over your test and checked your work for simple mistakes.

	What I can do in this unit	Level
4-1	I can translate word phrases into algebraic expressions and solve equations using zero sums.	
4-2	I can solve equations using zero sums and multiplying and dividing coefficients.	
4-3	I can solve equations involving fractions by clearing the fractions, multiplying by the Least Common Denominator (LCD).	
4-4	I can solve equations involving proportions using cross-multiplication.	
4-5	I can solve inequalities and graph the result on a number line.	

Code	Value	Description
N	Not Yet Meeting Expectations	I just don't get it.
MM	Minimally Meeting Expectations	Barely got it, I need some prompting to help solve the question.
M	Meeting Expectations	Got it, I understand the concept without help or prompting.
E	Exceeding Expectations	Wow, nailed it! I can use this concept to solve problems I may have not seen in practice. I also get little details that may not be directly related to this target correct.

4-1 I can translate word phrases into algebraic expressions and solve equations using zero sums.

Solve for x.

1) $7x = 6x - 3$

$-6x - 6x$

$x = -3$

2) $5x - 2 = 5 + 6x$

$-5x \ -5 \ -5 \ -5x$

$-7 = x$

$x = -7$

3) $-5x + 8 = -4x + 2$

$+5x \ -2 \quad +5x \ -2$

$6 = x$

$x = 6$

4) $-3x - 2 - 2x + 4 = -8x - 3 + 2x - 1$

$-5x + 2 = -6x - 4$

$+6x \ -2 \quad +6x \ -2$

$x = -6$

5) 12 less than twice a number is equal to 15.

$2x - 12 = 15$

$2x = 27$

$x = \frac{27}{2}$

6) The sum of three consecutive integers is the same as 15 more than twice the first integer. Find the first integer.

$x + x + 1 + x + 2 = 2x + 15$

$3x + 3 = 2x + 15$

$-2x - 3 \quad -2x - 3$

$x = 12$

7) Six less than double an integer is the same as six more than triple the number.

$2x - 6 = 3x + 6$

$-2x \ -6 \quad -2x \ -6$

$-12 = x$

$x = -12$

8) The sum of three consecutive integers is the same as nine more than twice the middle integer. Find the largest integer.

$x + x + 1 + x + 2 = 2(x+1) + 9$

$3x + 3 = 2x + 2 + 9$

$3x + 3 = 2x + 11$

$-2x \ -3 \quad -2x \ -3$

$x = 8$

$\therefore$ largest is 10

4-2 I can solve equations using zero sums and multiplying and dividing coefficients.

Solve for x.

9) $6x - 5 = 8x + 7$

$-8x+5 \quad -8x+5$

$\frac{-2x}{-2} = \frac{12}{-2}$

$x = -6$

10) $8x + 4 = 15x - 10$

$-15x-4 \quad -15x-4$

$\frac{-7x}{-7} = \frac{-14}{-7}$

$x = 2$

11) $6y + 2 = y - 5 + y - 7 + 2y$

$6y+2 = 4y-12$

$-4y-2 \quad -4y-2$

$\frac{2y}{2} = \frac{-14}{2}$

$y = -7$

12) $4a - 7 + 3a = -a - 13 + 2a$

$7a-7 = a-13$

$-a+7 \quad -a+7$

$\frac{6a}{6} = \frac{-6}{6}$

$a = -1$

13) $7y + 6 = 12y - 9$

$-12y-6 \quad -12y-6$

$\frac{-5y}{-5} = \frac{-15}{-5}$

$y = 3$

14) $15x + 3 - 2x = 11x + 6$

$13x+3 = 11x+6$

$-11x-3 \quad -11x-3$

$\frac{2x}{2} = \frac{3}{2}$

$x = \frac{3}{2}$

15) The sum of two consecutive integers is 49. What is the smallest integer?

$x + x + 1 = 49$

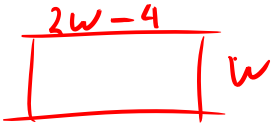
$2x + 1 = 49$

$-1 \quad -1$

$\frac{2x}{2} = \frac{48}{2}$

$x = 24$

16) The perimeter of a rectangle is 44cm. The length is four less than double the width. Determine the length and the width.



$2(2w-4) + 2w = 44$

$4w - 8 + 2w = 44$

$6w - 8 = 44$

$+8 \quad +8$

$\frac{6w}{6} = \frac{52}{6}$

$w = \frac{26}{3}$

4-3 I can solve equations involving fractions by clearing the fractions, multiplying by the Least Common Denominator (LCD).

Solve for x. Show all steps. Circle your answer.

17) $\frac{5}{6}x = 35$

$\frac{6}{5}\cdot\frac{5}{6}x = 35\left(\frac{6}{5}\right)$

$x = 42$

18) $5 - \frac{3}{4}x = -4$

$-5 \quad -5$

$-\frac{4}{3}\left(-\frac{3}{4}x\right) = -9\left(-\frac{4}{3}\right)$

$x = 12$

19) $\frac{2}{3}(3x - 4) = 6$

$3\cdot\frac{2}{3}(3x-4) = 6\cdot 3$

$2(3x-4) = 18$

$6x - 8 = 18$

$+8 \quad +8$

$\frac{6x}{6} = \frac{26}{6}$

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

20) $2x - \frac{3}{4} = -\frac{2}{3}$

$12\cdot 2x - \frac{12\cdot 3}{4} = -\frac{2}{3}\cdot 12$

$24x - 9 = -8$

$+9 \quad +9$

$\frac{24x}{24} = \frac{1}{24}$

$x = \frac{1}{24}$

21) $x - \frac{2}{3} = \frac{4}{5}$

$15\cdot x - \frac{15\cdot 2}{3} = \frac{4}{5}\cdot 15$

$15x - 10 = 12$

$+10 \quad +10$

$\frac{15x}{15} = \frac{22}{15}$

$x = \frac{22}{15}$

22) $5x + \frac{3}{10} = \frac{1}{4}$

$20\cdot 5x + \frac{20\cdot 3}{10} = \frac{1}{4}\cdot 20$

$100x + 6 = 5$

$\frac{100x}{100} = \frac{-1}{100}$

$x = -\frac{1}{100}$

23) 20 more than one third of a number is the same as five more than the original number. What is the number?

$3\cdot\frac{1}{3}x + 20 = x + 5\cdot 3$

$x + 60 = 3x + 15$

$-3x \quad -60 \quad -3x \quad -60$

$\frac{-2x}{-2} = \frac{-45}{-2}$

$x = \frac{45}{2}$

24) One fifth of a number plus one half is equal to 1. What is the number?

$10\cdot\frac{1}{5}x + \frac{10\cdot 1}{2} = 1\cdot 10$

$2x + 5 = 10$

$-5 \quad -5$

$\frac{2x}{2} = \frac{5}{2}$

$x = \frac{5}{2}$

4-4 I can solve equations involving proportions using cross-multiplication.

Solve for x. Show all steps. Circle your answer.

25) $\frac{x}{10} = \frac{5}{2}$

$\frac{2x}{2} = \frac{50}{2}$

$x = 25$

26) $\frac{3}{4} = \frac{x}{3}$

$\frac{4x}{4} = \frac{9}{4}$

$x = \frac{9}{4}$

27) $\frac{x+1}{2} = \frac{x-2}{3}$

$3(x+1) = 2(x-2)$

$3x + 3 = 2x - 4$

$-2x - 3 \quad -2x - 3$

$x = -7$

28) $\frac{x-3}{4} = \frac{x+4}{5}$

$5(x-3) = 4(x+4)$

$5x - 15 = 4x + 16$

$-4x + 15 \quad -4x + 15$

$x = 31$

29) $\frac{5x-3}{4} = \frac{3x-1}{2}$

$2(5x-3) = 4(3x-1)$

$10x - 6 = 12x - 4$

$-12x + 6 \quad -12x + 6$

$\frac{-2x}{-2} = \frac{2}{-2}$

$x = -1$

30) $\frac{3x-4}{5} = \frac{-2x+7}{3}$

$3(3x-4) = 5(-2x+7)$

$9x - 12 = -10x + 35$

$+10x + 12 \quad +10x + 12$

$\frac{19x}{19} = \frac{47}{19}$

$x = \frac{47}{19}$

31) $\frac{3x-2}{2} = \frac{x}{6}$

$6(3x-2) = 2x$

$18x - 12 = 2x$

$-2x \quad +12 \quad -2x + 12$

$\frac{16x}{16} = \frac{12}{16} = \frac{3}{4}$

$x = \frac{3}{4}$

32) $\frac{x+7}{5} = \frac{3x-4}{10}$

$10(x+7) = 5(3x-4)$

$10x + 70 = 15x - 20$

$-15x - 70 \quad -15x - 70$

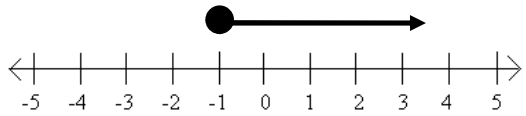
$\frac{-5x}{-5} = \frac{-90}{-5}$

$x = 18$

4-5 I can solve inequalities and graph the result on a number line.

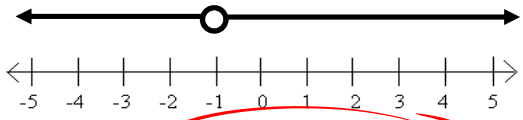
Write an inequality that describes each range of values illustrated by each graph. Use the variable x.

33)



$x \geq -1$

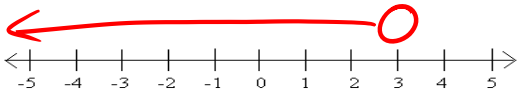
34)



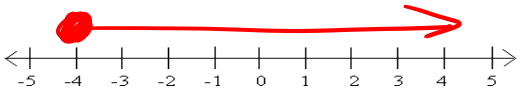
$x \neq -1$

Graph each inequality on a number line.

35) $x < 3$



36) $x \geq -4$



Solve each inequality. Show your work.

37) $12 - 4x \leq 16$

$-12 \quad -12$

$\frac{-4x}{-4} \leq \frac{4}{-4}$

$x \geq -1$

38) $5x > -20$

$\frac{5x}{5} > \frac{-20}{5}$

$x > -4$

39) $-1 < 8 + x$

$-8 \quad -8$

$-9 < x$

$x > -9$

40) $1 + 3x > x - 5$

$-1 \quad -x \quad -x \quad -1$

$\frac{2x}{2} > \frac{-6}{2}$

$x > -3$

41) $-6x - 1 \leq 4x + 9$

$x \geq -1$

$-4x \quad -4x$

$\frac{-10x - 1}{-10} \leq \frac{9}{-10}$

$+1 \quad +1$

$-10x \leq 10$

42) $8n - 2(n + 5) < 4n - 16$

$8n - 2n - 10 < 4n - 16$

$6n - 10 < 4n - 16$

$-4n + 10 \quad -4n + 10$

$\frac{2n}{2} < \frac{-6}{2}$

$n < -3$

43) $2n - 12 \leq 6(2 + n)$

$2n - 12 \leq 12 + 6n$

$-6n + 12 \quad +12 \quad -6n$

$\frac{-4n}{-4} \leq \frac{24}{-4}$

$n \geq -6$

44) $-3(2n - 6) < 3n$

$-6n + 18 < 3n$

$+6n \quad +6n$

$18 < 9n$

$\frac{9n}{9} > \frac{18}{9}$

$n > 2$