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) $7x = 6x - 5$

$-6x \quad -6x$

$x = -5$

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

$-4x \quad +3 \quad +3 \quad -4x$

$x = 10$

3) $-4x + 9 = -3x + 2$

$+4x \qquad +4x$

$9 = x + 2$

$-2 \qquad -2$

$7 = x$

$x = 7$

4) $-3x - 1 - 2x + 5 = -8x - 4 + 2x - 2$

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

$+6x \qquad +6x$

$-4 \qquad -4$

$x = -10$

5) 12 less than twice a number is equal to 20.

$2x - 12 = 20$

$+12 \quad +12$

$\frac{2x}{2} = \frac{32}{2}$

$x = 16$

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

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

$3x + 3 = 2x + 15$

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

$x = 12$

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

$2x - 5 = 3x + 6$

$-2x \qquad -2x$

$-6 \qquad -6$

$-11 = x$

$x = -11$

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

$x + x + 1 + x + 2 = 2(x + 1) + 10$

$3x + 3 = 2x + 2 + 10$

$3x + 3 = 2x + 12$

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

$x = 9$

11

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

Solve for x.

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

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

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

$x = -7$

10) $8x + 3 = 15x - 12$

$-15x-3 \quad -15x-3$

$\frac{-7x}{-7} = \frac{-15}{-7}$

$x = \frac{15}{7}$

11) $6y + 2 = y - 4 + y - 5 + 2y$

$6y+2 = 4y-9$

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

$\frac{2y}{2} = \frac{-11}{2}$

$y = -\frac{11}{2}$

12) $4a - 5 + 3a = -a - 15 + 2a$

$7a-5 = a-15$

$-a+5 \quad -a+5$

$\frac{6a}{6} = \frac{-10}{6}$

$a = -\frac{5}{3}$

13) $7y + 8 = 12y - 11$

$7y+8 = 12y-11$

$-12y-8 \quad -12y-8$

$\frac{-5y}{-5} = \frac{-19}{-5}$

$y = \frac{19}{5}$

14) $15x + 6 - 2x = 11x + 5$

$13x+6 = 11x+5$

$-11x-6 \quad -11x-6$

$\frac{2x}{2} = \frac{-1}{2}$

$x = -\frac{1}{2}$

15) The sum of three consecutive integers is 66. What is the largest integer?

$x + x+1 + x+2 = 66$

$3x+3 = 66$

$-3 \quad -3$

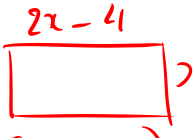
$\frac{3x}{3} = \frac{63}{3}$

$x = 21$

23 ← largest!

21, 22, and 23

16) The perimeter of a rectangle is 46cm. The length is four less than double the width. Determine the length and the width.



$2(2x-4) + 2x = 46$

$4x - 8 + 2x = 46$

$6x - 8 = 46$

$+8 \quad +8$

$6x = 54$

$x = \frac{54}{9}$

$= 6\text{cm}$

$2(6) - 4 = 8$

6cm by 8cm

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) $\frac{5}{6}x = 15$

$\left(\frac{6}{5}\right)\frac{5}{6}x = 15\left(\frac{6}{5}\right)$

$x = 18$

18) $5 - \frac{1}{4}x = -4$

$-5 \quad -5$

$(-4)\left(-\frac{1}{4}x\right) = -9(-4)$

$x = 36$

19) $\frac{2}{3}(3x - 6) = 5$

$3 \cdot \frac{2}{3}(3x-6) = 5 \cdot 3$

$2(3x-6) = 15$

$6x - 12 = 15$

$+12 \quad +12$

$6x = 27$

$x = \frac{27}{6}$

$x = \frac{9}{2}$

20) $2x - \frac{1}{4} = -\frac{4}{3}$

$12 \cdot 2x - \frac{12^3 \cdot 1}{4} = -\frac{4}{3} \cdot 12^4$

$24x - 3 = -16$

$+3 \quad +3$

$\frac{24x}{24} = \frac{-13}{24}$

$x = -\frac{13}{24}$

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

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

$15x - 10 = 9$

$+10 \quad +10$

$15x = 19$

$x = \frac{19}{15}$

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

$20.5x + \frac{20 \cdot 1}{10} = \frac{3}{4} \cdot 20^5$

$100x + 2 = 15$

$-2 \quad -2$

$\frac{100x}{100} = \frac{13}{100}$

$x = \frac{13}{100}$

23) 10 more than one third of a number is the same as five more than the original number. What is the number?

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

$x + 30 = 3x + 15$

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

$15 = 2x$

$x = \frac{15}{2}$

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

$6 \cdot \frac{1}{6}x + 6 \cdot \frac{1}{2} = 1 \cdot 6$

$x + 3 = 6$

$-3 \quad -3$

$x = 3$

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

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

$5x - 5 = 4x + 12$

$-4x + 5 \quad -4x + 5$

$x = 17$

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

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

$10x - 4 = 12x - 4$

$-12x + 4 \quad -12x + 4$

$\frac{-2x}{-2} = \frac{0}{-2}$

$x = 0$

30) $\frac{3x-4}{5} = \frac{-2x+6}{3}$

$3(3x-4) = 5(-2x+6)$

$9x - 12 = -10x + 30$

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

$\frac{19x}{19} = \frac{42}{19}$

$x = \frac{42}{19}$

31) $\frac{3x-1}{2} = \frac{x}{6}$

$6(3x-1) = 2x$

$18x - 6 = 2x$

$-18x \quad -18x$

$\frac{-6}{-16} = \frac{-16x}{-16}$

$x = \frac{3}{8}$

32) $\frac{x+7}{5} = \frac{3x-2}{10}$

$10(x+7) = 5(3x-2)$

$10x + 70 = 15x - 10$

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

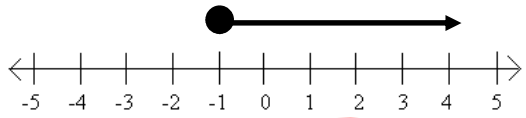
$\frac{-5x}{-5} = \frac{-80}{-5}$

$x = 16$

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

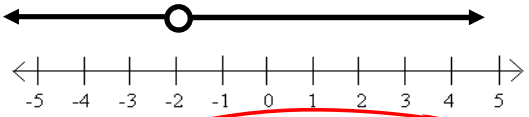
Write an inequality that describes each range of values illustrated by each graph. Use the variable x.

33)



$x \geq -1$

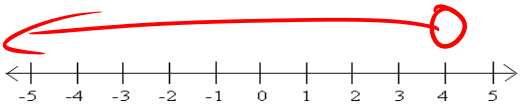
34)



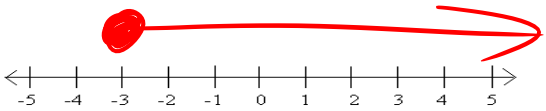
$x \neq -2$

Graph each inequality on a number line.

35) $x < 4$



36) $x \geq -3$



Solve each inequality. Show your work.

37) $10 - 4x \leq 14$

$-10 \quad -10$

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

$x \geq -1$

38) $5x > -15$

$\frac{5x}{5} > \frac{-15}{5}$

$x > -3$

39) $-1 < 7 + x$

$-7 \quad -7$

$-8 < x$

$x > -8$

40) $3 + 3x > x - 7$

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

$\frac{2x}{2} > \frac{-10}{2}$

$x > -5$

41) $-6x - 2 \leq 4x + 8$

$-4x + 2 \quad -4x + 2$

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

$x \geq -1$

42) $8n - 3(n + 6) < 4n - 16$

$8n - 3n - 18 < 4n - 16$

$5n - 18 < 4n - 16$

$-4n + 18 \quad -4n + 18$

$n < 2$

43) $2n - 12 \leq 8(4 + n)$

$2n - 12 \leq 32 + 8n$

$-8n + 12 \quad +12 \quad -8n$

$\frac{-6n}{-6} \leq \frac{44}{-6}$

$n \geq -\frac{44}{6}$

$n \geq -\frac{22}{3}$

44) $-2(2n - 7) < 3n$

$-4n + 14 < 3n$

$-3n \quad -14 \quad -3n \quad -14$

$\frac{-7n}{-7} < \frac{-14}{-7}$

$n > 2$