

Name _____

8A; Algebra 1

Date _____

Period _____

Extra Review for Word Problem Exam

I. Review

1) Solve the following $2x + 6 < 18$. Write your answer in set notation and interval notation.

2) Solve the following: $5|x + 7| - 10 = -5$

3) What is the largest integer that makes the inequality $3x - 7 < 11$

(a) -5 (b) 6 (c) 7 (d) 5

4) Solve the following for x: $4xy + 3y = z$

5) If $x + 5$ is an odd integer, what is the next consecutive odd integer?

6) If $x - 6$ is an odd integer, what is the next consecutive even integer?

7) Which property does the following represent? $(4 + 3) + 6 = 4 + (6 + 3)$

8) Simplify the following: $-5x^2y^3$ when x is -3 and y is 5

9) If the length of each side of a regular hexagon is $(4x + 7)$, what is the perimeter of the hexagon?

10) How many solutions does $3(x + 8) = 3x + 24$ have?

11) Write the following in set notation: $(-\infty, -10] \cup (5, \infty)$.

For 12- 23: Use LESC to solve

12) One number is 2 less than another. If 4 times the larger is subtracted from 5 times the smaller, the result is 10. Find the numbers.

13) Six times a number equals 3 times the number, increased by 24. Find the number.

14) Find three consecutive odd integers such that the largest decreased by 3 times the second is 47 less than the smaller.

15) Find three consecutive integers such that the sum of the first two is 24 more than the third.

16) The length of the second side of a triangle is 2 inches less than the length of the first side. The length of the third side is 12 inches more than the length of the first side. The perimeter of the triangle is 73 inches. Find the length of each side of the triangle.

17) The length of a rectangle is twice the width. If the length is increased by 4 inches and the width is decreased by 1 inch, a new rectangle is formed whose perimeter is 198 inches. Find the dimensions of the original rectangle.

18) A purse contains \$4.70 in nickels and quarters. There are 30 coins in all. How many of each kind are there?

19) Amanda deposited \$4.50 in nickels, quarters, and dimes in her coin bank. The number of dimes exceeded the number of nickels by 5, and the number of quarters was 16 less than the number of nickels. Find the number of each kind of coin she deposited.

20) Mr. Burke had a sum of money in a bank. After he deposited an additional sum of \$100, he had at least \$550 in the bank. At least how much money did Mr. burke have in the bank originally?

21) Three times a number increased by 8 is at most 40 more than the number. Find the greatest value of the number.

22) Two consecutive even numbers are such that their sum is greater than 98 decreased by twice the larger. Find the smallest possible value for the integers.

23) Emma wants \$29 to buy music online. Her father agrees to pay her \$6 an hour for gardening in addition to her \$5 weekly allowance for helping around the house. What is the minimum number of hours Emma must work at gardening to receive at least \$29 this week?

Extra Review for Word Problem Exam

I. Review

1) Solve the following $2x + 6 < 18$. Write your answer in set notation and interval notation.

$$\begin{array}{r} \cancel{-6} - 6 \\ 2x < 12 \\ \hline \frac{2x}{2} < \frac{12}{2} \\ x < 6 \end{array}$$

S.N. $\{x \in \mathbb{R} \mid x < 6\}$
 I.N. $(-\infty, 6)$

2) Solve the following: $5|x+7| - 10 = -5$

$$\begin{array}{r} \cancel{-10} + 10 \\ 5|x+7| = 5 \\ \hline \frac{5|x+7|}{5} = \frac{5}{5} \\ |x+7| = 1 \end{array}$$

$$\begin{array}{l} x+7 = 1 \\ \cancel{-7} - 7 \\ \hline x = -6 \\ \checkmark \end{array} \quad \left| \quad \begin{array}{l} x+7 = -1 \\ \cancel{-7} - 7 \\ \hline x = -8 \\ \checkmark \end{array} \right. \quad \{-6, -8\}$$

3) What is the largest integer that makes the inequality $3x - 7 < 11$

(a) -5

(b) 6

(c) 7

(d) 5

$$\begin{array}{r} \cancel{-7} + 7 \\ 3x < 18 \\ \hline \frac{3x}{3} < \frac{18}{3} \\ x < 6 \\ 5 < 6 \checkmark \end{array}$$

4) Solve the following for x :

$$\begin{array}{r} 4xy + 3y = z \\ \cancel{-3y} - 3y \\ \hline 4xy = z - 3y \\ \hline \frac{4xy}{4y} = \frac{z - 3y}{4y} \\ x = \frac{z - 3y}{4y} \end{array}$$

5) If $x + 5$ is an odd integer, what is the next consecutive odd integer?

$$\begin{array}{r} +2 \\ \hline x + 7 \end{array}$$

6) If $x - 6$ is an odd integer, what is the next consecutive even integer?

$$\begin{array}{r} +1 \\ \hline x - 5 \end{array}$$

7) Which property does the following represent? $(4 + 3) + 6 = 4 + (6 + 3)$

Commutative Property of Addition

8) Simplify the following: $-5x^2y^3$ when x is -3 and y is 5

$$\begin{aligned} & -5(-3)^2(5)^3 \\ & -5(9)(125) \\ & \underline{-5625} \end{aligned}$$

9) If the length of each side of a regular hexagon is $(4x + 7)$, what is the perimeter of the hexagon?

$$\begin{aligned} & 6(4x + 7) \\ & \underline{24x + 42} \end{aligned}$$

10) How many solutions does $3(x + 8) = 3x + 24$ have?

$$\begin{array}{r} 3x + 24 = 3x + 24 \\ -3x \quad -3x \\ \hline 24 = 24 \quad \boxed{\text{infinite amount}} \end{array}$$

11) Write the following in set notation: $(-\infty, -10] \cup (5, \infty)$.

$$\{x \in \mathbb{R} \mid x \leq -10 \text{ or } x > 5\}$$

For 12- 23: Use LESC to solve

12) One number is 2 less than another. If 4 times the larger is subtracted from 5 times the smaller, the result is 10. Find the numbers.

L	E	S	C
$x =$ the larger # $(x-2) =$ the smaller #	$5(x-2) - 4x = 10$ $5x - 10 - 4x = 10$ $x - 10 = 10$ $\quad +10 \quad +10$ <hr/> $x = 20$ $x - 2 = 18$	The smaller # is 18 The larger # is 20	$20 - 2 = 18 \checkmark$ <hr/> $5(18) = 90$ $4(20) = 80$ $90 - 80 = 10 \checkmark$

13) Six times a number equals 3 times the number, increased by 24. Find the number.

L	E	S	C
let X = the #	$6x = 3x + 24$ $\begin{array}{r} -3x \\ \hline 3x = 24 \\ \hline \frac{3x}{3} = \frac{24}{3} \\ \hline x = 8 \end{array}$	The # is 8.	$6(8) = 48$ $3(8) = 24$ $24 + 24 = 48$

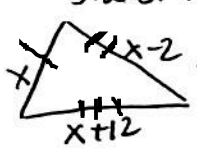
14) Find three consecutive odd integers such that the largest decreased by 3 times the second is 47 less than the smaller.

L	E	S	C
let X = 1 st COI X+2 = 2 nd COI X+4 = 3 rd COI	$X+4 - 3(X+2) = X-47$ $X+4 - 3X - 6 = X-47$ $\begin{array}{r} -2X - 2 = X - 47 \\ +2X \quad +2X \\ \hline -2 = 3X - 47 \\ +47 \quad +47 \\ \hline 45 = 3X \\ \hline 15 = X \end{array}$ $X = 15$ $X+2 = 17$ $X+4 = 19$	The 3 COI's are 15, 17 + 19	$3(n) = 51$ $19 - 51 = -32$ $15 - 47 = -32$

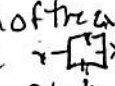
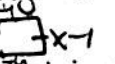
15) Find three consecutive integers such that the sum of the first two is 24 more than the third.

L	E	S	C
let X = 1 st CI X+1 = 2 nd CI X+2 = 3 rd CI	$X + X + 1 = X + 2 + 24$ $2X + 1 = X + 26$ $\begin{array}{r} -X \quad -X \\ \hline X + 1 = 26 \\ \hline -1 \quad -1 \\ \hline X = 25 \\ X+1 = 26 \\ X+2 = 27 \end{array}$	The 3 CI's are 25, 26 + 27	$25 + 26 = 51$ $27 + 24 = 51$

16) The length of the second side of a triangle is 2 inches less than the length of the first side. The length of the third side is 12 inches more than the length of the first side. The perimeter of the triangle is 73 inches. Find the length of each side of the triangle.

L	E	S	C
let X = the length of the 1 st side of the triangle X-2 = the length of the 2 nd side of the triangle X+12 = the length of the 3 rd side of the triangle 	$X + X - 2 + X + 12 = 73$ $3X + 10 = 73$ $\begin{array}{r} -10 \quad -10 \\ \hline 3X = 63 \\ \hline \frac{3X}{3} = \frac{63}{3} \\ \hline X = 21 \\ X - 2 = 19 \\ X + 12 = 33 \end{array}$	the length of the 1 st side of the triangle is 21 in. the length of the 2 nd side is 19 in. + the length of the 3 rd side is 33 in.	$21 - 2 = 19$ $21 + 12 = 33$ $\begin{array}{r} 21 \\ 19 \\ \hline 73 \\ \hline 73 \end{array}$

17) The length of a rectangle is twice the width. If the length is increased by 4 inches and the width is decreased by 1 inch, a new rectangle is formed whose perimeter is 198 inches. Find the dimensions of the original rectangle.

<p>let x = the width of the rectangle  $2x$ = the length of the rectangle $x-1$ = the new width  $x+4$ = the new length</p>	<p>$x-1 + x-1 + 2x+4 + 2x+4 = 198$ $2(x-1) + 2(2x+4) = 198$ $2x-2 + 4x+8 = 198$ $6x+6 = 198$ $6x = 192$ $x = 32$ $2x = 64$</p>	<p>The original width is 32 inches & the original length is 64 inches</p>	<p>$32 \cdot 2 = 64 \checkmark$ $64 + 4 = 68$ $32 - 1 = 31$ 68 68 31 31 $\frac{198 \checkmark}{198}$</p>
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18) A purse contains \$4.70 in nickels and quarters. There are 30 coins in all. How many of each kind are there?

<p>let x = the # of quarters $30-x$ = the # of nickels $25(x)$ = the total value of the quarters $15(30-x)$ = the total value of the nickels</p>	<p>$.25(x) + .05(30-x) = 4.70$ $.25x + 1.5 - .05x = 4.70$ $.2x + 1.5 = 4.70$ $.2x = 3.2$ $x = 16$ $30-x = 14$</p>	<p>There are 16 Quarters + 14 nickels</p>	<p>$.25(16) = 4.00$ $.05(14) = .70$ 4.70 $16 + 14 = 30 \checkmark$</p>
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19) Amanda deposited \$4.50 in nickels, quarters, and dimes in her coin bank. The number of dimes exceeded the number of nickels by 5, and the number of quarters was 16 less than the number of nickels. Find the number of each kind of coin she deposited.

<p>let x = the # of nickels $x+5$ = the # of dimes $x-16$ = the # of quarters $05(x)$ = the total value of the N's $10(x+5)$ = the total value of the D's $25(x-16)$ = the total value of the Q's</p>	<p>$.05(x) + .10(x+5) + .25(x-16) = 4.50$ $.05x + .10x + .50 + .25x - 4 = 4.50$ $.4x - 3.5 = 4.50$ $.4x = 8$ $x = 20$ $x+5 = 25$ $x-16 = 4$</p>	<p>Amanda deposited 20 nickels, 25 dimes + 4 quarters</p>	<p>$.05(20) = 1.00$ $.10(25) = 2.50$ $.25(4) = 1.00$ 4.50 $20 + 5 = 25 \checkmark$ $20 - 16 = 4 \checkmark$</p>
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20) Mr. Burke had a sum of money in a bank. After he deposited an additional sum of \$100, he had at least \$550 in the bank. At least how much money did Mr. Burke have in the bank originally?

<p>let x = the amount of \$ Mr. Burke originally had</p>	<p>$x + 100 \geq 550$ $\frac{-100 \quad -100}{x \geq 450}$</p>	<p>Mr. Burke had at least \$450 originally in the bank</p>	<p>$450 + 100 = 550$ $550 \geq 550$ $449 + 100 = 549$ $549 \not\geq 550$</p>
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21) Three times a number increased by 8 is at most 40 more than the number. Find the greatest value of the number.

Let
 $x =$ the greatest value of the #

$$\begin{array}{r} 3x + 8 \leq x + 40 \\ -x \quad -x \\ \hline 2x + 8 \leq 40 \\ -8 \quad -8 \\ \hline 2x \leq 32 \\ \frac{2x}{2} \leq \frac{32}{2} \\ x \leq 16 \end{array}$$

The greatest value of the number is 16.

$$\begin{array}{r} 3(16) = 48 \\ 48 + 8 = 56 \\ \hline 16 + 40 = 56 \\ 56 \leq 56 \checkmark \end{array}$$

$$\begin{array}{r} 3(17) = 51 \\ 51 + 8 = 59 \\ 40 + 17 = 57 \\ 59 \neq 57 \end{array}$$

22) Two consecutive even numbers are such that their sum is greater than 98 decreased by twice the larger. Find the smallest possible value for the integers.

Let
 $x =$ 1st CEI
 $x+2 =$ 2nd CEI

$$\begin{array}{r} x + x + 2 > 98 - 2(x + 2) \\ 2x + 2 > 98 - 2x - 4 \\ 2x + 2 > 94 - 2x \\ +2x \quad +2x \\ \hline 4x + 2 > 94 \\ -2 \quad -2 \\ \hline 4x > 92 \\ \frac{4x}{4} > \frac{92}{4} \\ x > 23 \\ x + 2 > 25 \end{array}$$

The smallest possible CEI's are 24 + 26.

$$\begin{array}{r} 24 + 26 = 50 \\ \hline 2(26) = 52 \\ 98 - 52 = 46 \\ 50 > 46 \checkmark \end{array}$$

$$\begin{array}{r} 22 + 24 = 46 \\ \hline 2(24) = 48 \\ 98 - 48 = 50 \\ 46 \neq 50 \end{array}$$

23) Emma wants \$29 to buy music online. Her father agrees to pay her \$6 an hour for gardening in addition to her \$5 weekly allowance for helping around the house. What is the minimum number of hours Emma must work at gardening to receive at least \$29 this week?

Let
 $x =$ the # of hours Emma must work at gardening

$$\begin{array}{r} 6x + 5 \geq 29 \\ -5 \quad -5 \\ \hline 6x \geq 24 \\ \frac{6x}{6} \geq \frac{24}{6} \\ x \geq 4 \end{array}$$

The minimum # of hours that Emma must work at gardening to receive at least \$29 is 4 hours

$$\begin{array}{r} 4(6) = 24 \\ 24 + 5 = 29 \\ 29 \geq 29 \checkmark \end{array}$$

$$\begin{array}{r} (3) 6 = 18 \\ 18 + 5 = 23 \\ 18 \neq 23 \end{array}$$