Algebra 1 Summer Assignment
Lawrence Woodmere Academy
2019

This packet is due the first day of classes in September. It will count as your first exam grade for the first quarter. All work for short answer questions should be done on loose leaf paper attached to your assignment. If the assignment is late, 10 points will be dedicated each day. Please use online resources such as:

https://www.khanacademy.org/ and https://www.youtube.com/

to assist you with any unknown or forgotten material. If you have any questions regarding your summer assignment, please visit the school website or email Ms. Tucker at mtucker@lawrencewoodmere.org

Good luck and have a great summer!

This packet belongs to:_____

Section 1: Integer Computations

Integers: Any number from the set { ..., -3, -2, -1, 0, 1, 2, 3, ...}-

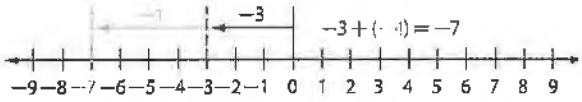
You can visually use a number line to find the answer to a problem:

Example 1 Add Integers with the Same Sign

Use a number line to find $-3 + (-4)$.

Step 1 Draw an arrow from 0 to -3.

Step 2 Draw a second arrow 4 units to the left to represent adding -4.



The second arrow ends at -7. So, $-3 + (-4) = -7$.

Other patterns in adding integers the following:

Same Signs (+ + or − −)		Different Signs (+ − or − +)	
$3 + 5 = 8$	3 and 5 are positive. Their sum is positive.	$3 + (-5) = -2$	−5 has the greater absolute value. Their sum is negative.
$-3 + (-5) = -8$	−3 and −5 are negative. Their sum is negative.	$-3 + 5 = 2$	5 has the greater absolute value. Their sum is positive.

Patterns in Multiplication:

Same Signs (+ + or − −)		Different Signs (+ − or − +)	
$3(5) = 15$	3 and 5 are positive. Their product is positive.	$3(-5) = -15$	3 and −5 have different signs. Their product is negative.
$-3(-5) = 15$	−3 and −5 are negative. Their product is positive.	$-3(5) = -15$	−3 and 5 have different signs. Their product is negative.

Example 1:

$-10 + 7 - (-2) - 8$

$-3 - (-2) - 8$

$-3 + 2 - 8$

$-1 - 8 = -9$

Order of operations states to go left to right.

Remember... minus a negative is the same as addition.

Example 2:

$(-2 - (-7)) \cdot (-3)$

$(-2 + 7) \cdot (-3)$

$(4) \cdot (-3) = -12$

Section 2: Order of Operations

P arenthesis

E xponents

Which ever comes first, left to right.
- **M** ultiplication
- **D** ivision

Which ever comes first, left to right.
- **A** ddition
- **S** ubtraction

Example:

Simplify the following:

$\frac{(18+4)}{2} - 3(10 \cdot 2 - 3 \cdot 6)$ ←Work inside first set of parenthesis first

$= \frac{22}{2} - 3(10 \cdot 2 - 3 \cdot 6)$ ←Work inside second set of parenthesis by multiplying first

$= \frac{22}{2} - 3(20 - 18)$ ←Continue to work inside second set of porenthesis by subtracting

$= \frac{22}{2} - 3(2)$ ←Divide the fraction

$= 11 - 3(2)$ ←Multiply

$= 11 - 6$ ←Subtroct

$= 5$

Section 3: Real Number Comparison

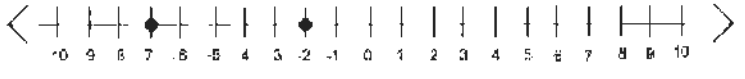
An Inequality is a mathematical sentence that compares the value of two expressions using an inequality symbol.

Inequality Symbol	Pronounced	Example
$<$	Less than	$4 < 9$
$\leq$	Less than or equal to	$-3 \leq 2$
$>$	Greater than	$-4 > -7$
$\geq$	Greater than or equal to	$5 \geq 5$
$\neq$	Not equal to	$7 \neq 11$

When comparing two numbers with an inequality symbol, it can be useful to plot both numbers on a number line. By plotting both numbers on a number line, you can see which number is greater simply by seeing which number is further to the right. .

Example: Fill in the blank with the correct inequality symbol ($<$, $>$)

$-7\_\_\_-2$

	**First plot a point on each number on a number line**
$-7 < -2$ 	**Since -2 is further to the right, it is the larger number, therefore you use a less than sign because -7 is less than -2**

HINT: When comparing fractions you can either get a common denominator to compare, or convert the fraction(s) to decimals then compare.

Section 4: Variables and Verbal Expressions

Write each phrase as an algebraic expression.

Phrase	Expression
nine increased by a number x	9 + x
fourteen decreased by a number p	14 - p
seven less than a number t	t - 7
the product af 9 and a number n	$9 \cdot n$ or 9n
thirty-two divided by a number y	$32 \div y$ or $\frac{32}{y}$

Write an algebraic expression for each phrase.

1. 7 increased by x

2. *p* multiplied by 3

3. 10 decreased by *m*

4. *n* less than 7

5. the product of 2 and *q*

6. 3 more than *m*

7. the difference of 8 and a number

8. the sum of 4 and a number

9. the product of 2 and a number

10. 3 increased by a number

11. 10 plus the quotient of a number and 15

12. 12 less than a number

Section 6: Solving One- Step Equations

A **one-step equation** is as straightforward as it sounds. You will only need to perform one step in order to solve the equation. The goal in solving an equation is to only have a variable on one side of the equal sign and numbers on the other side of the equal sign.

The strategy for getting the variable by itself involves using opposite operations. The most important thing to remember in solving a linear equation is that whatever you do to one side of the equation, you MUST da ta the other side. So if you subtract a number from one side, you MUST subtract the same value from the ather side. You will see how this works in the examples.

Example:

Solve $-2 = k - 14$.

$-2 - k - 14$ ← Since 14 is subtracted from k, you must add 14 to each side to isolate k.

$-2 + 14 - k - 14 + 14$ ← Add 14 to each side.

$12 - k$ ← Simplify.

Example:

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

$\frac{x}{-7} \cdot 15$ ← Since x is divided by -7, you must multiply each side by -7 to isolate x.

$7 \cdot \left(\frac{x}{-7}\right) = 7 \cdot 15$ ← Multiply each side by -7.

$x = -105$ ← Simplify.

Example:

Solve $816 = 8c$.

$816 = 8c$ ← Since c is multiplied by 8, you must divide each side by 8 to isolate c.

$\frac{816}{8} = \frac{8c}{8}$ ← Divide each side by 8.

$102 = c$ ← Simplify.

Solve the following one-step equations:

1) $x - 2 = 6$

2) $y + 1.5 = 3.7$

3) $2a = 22$

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

5) $\frac{1}{4}x = \frac{5}{8}$

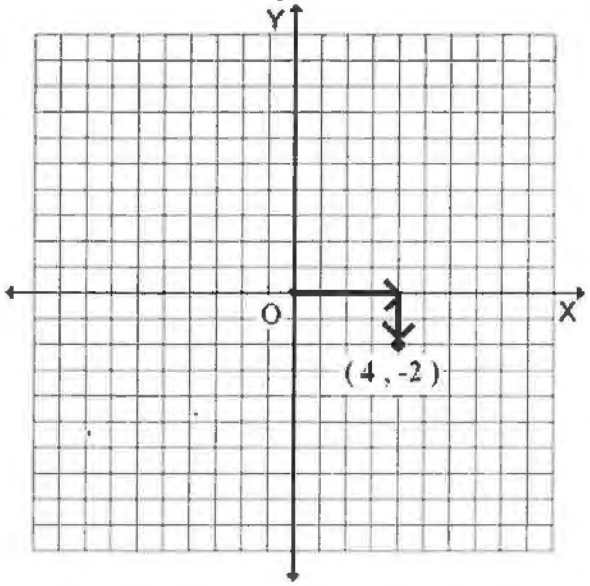
6) $\frac{x}{3} = 3$

Section 8: Plotting on the Coordinate Plane

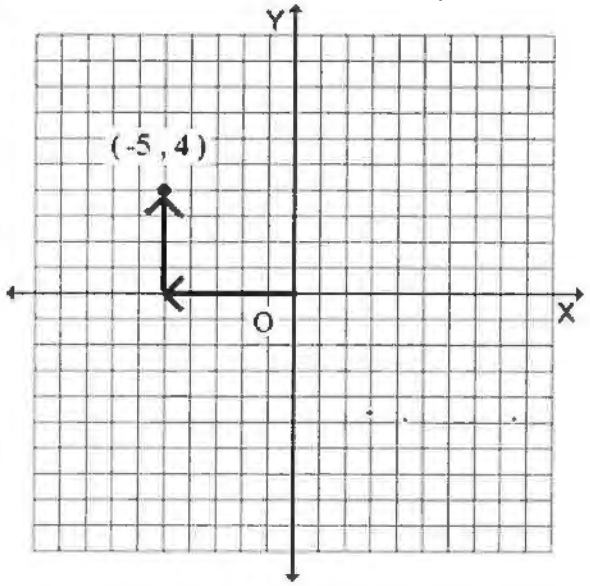
You can graph a point on a coordinate plane. Use an ordered pair (x, y) to record the coordinates. The first number in the pair is the x-coordinate. The second number is the y-coordinate.

To graph a point, start at the arigin, O. Move horizontally according to the value of x. Move vertically according to the value of y.

Example 1: Plot the ordered pair (4, -2)
Start at O, move right 4, then down 2.



Example 2: Plot the ordered pair (-5, 4)
Start at O, move left 5, then up 4.

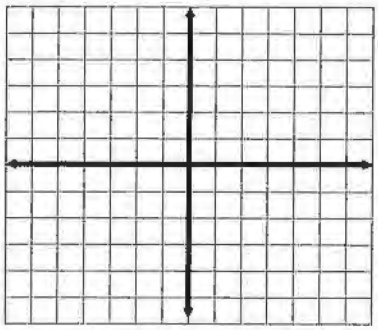


Section 9: Graphing Linear Equations

I) By using a table, graph each of the following on the graph paper provided.

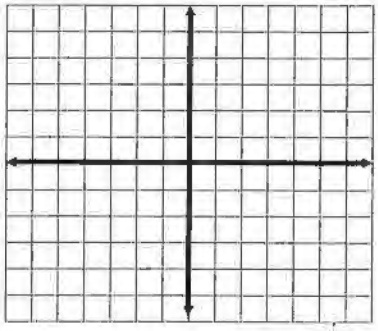
1. $y = 2x - 3$

x		y



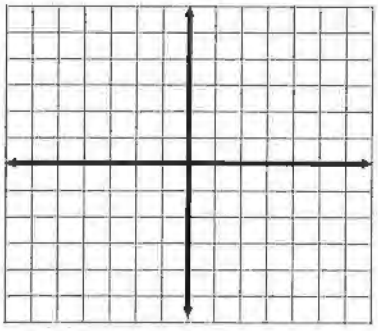
2. $y = -3x + 2$

x		y



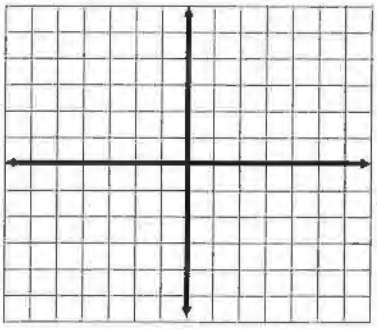
3. $6x + 24 = -12y$

x		y



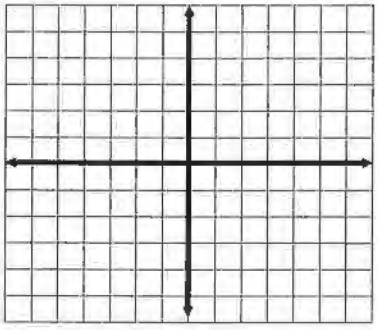
4. $2x - y = 4$

x		y



III) Write in slope-intercept form then graph each of the following.

9. $3x + y = 2$

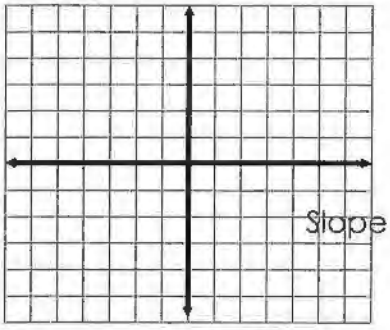


Slope intercept form _____

Slope _____

y intercept = _____

10. $-x + 2y = 6$

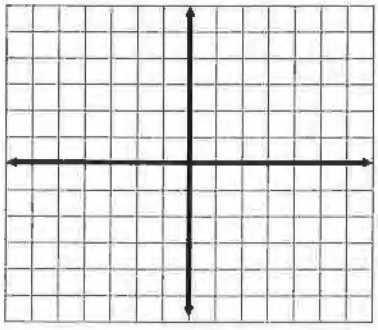


Slope intercept form _____

Slope _____

y intercept = _____

11. $4x - y - 3 = 0$

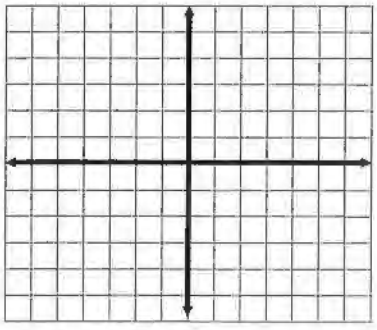


Slope intercept form _____

Slope _____

y intercept = _____

12. $2x + 3y - 4 = x + 5$



Slope intercept form _____

Slope _____

y intercept = _____

Simplify (Simplifying Radicals that are not Perfect Squares):

1. $\sqrt{20} = \sqrt{4} \cdot \sqrt{5} = 2\sqrt{5}$
2. $\sqrt{27} = \sqrt{9}\sqrt{3} = 3\sqrt{3}$
3. $\sqrt{48} = \sqrt{16}\sqrt{3} = 4\sqrt{3}$

4. $\sqrt{45} = \sqrt{\ }\sqrt{\ } = \_\sqrt{\ }$
5. $\sqrt{12} = \sqrt{\ }\sqrt{\ } =$ _____
6. $\sqrt{50} =$

7. $\sqrt{a^5} = \sqrt{a^4}\sqrt{a} = a^2\sqrt{a}$
8. $\sqrt{x^9} = \sqrt{\ }\sqrt{\ } =$ _____
9. $\sqrt{x^3} =$

Practice:

_____ 1. $\sqrt{64}$
_____ 2. $-\sqrt{18}$
_____ 3. $\sqrt{32}$

_____ 4. $\sqrt{50}$
_____ 5. $\sqrt{400}$
_____ 6. $\sqrt{x^6}$

_____ 7. $\sqrt{x^7}$
_____ 8. $\sqrt{16x^{16}}$
_____ 9. $\sqrt{9x^9}$

_____ 10. $\sqrt{40x^8}$
_____ 11. $\sqrt{25x^7}$
_____ 12. $\sqrt{12x^5}$

_____ 13. $\sqrt{a^2b^4}$
_____ 14. $\sqrt{49a^8x^{12}}$
_____ 15. $\sqrt{28x^9y^6}$

_____ 16. $\sqrt{32m^7n^{11}}$
_____ 17. $\sqrt{20x^{10}y^5}$
_____ 18. $\sqrt{100ab^4}$

_____ 19. $\sqrt{75x^8y^3}$
_____ 20. $\sqrt{98x^7y^5}$