

Name \_\_\_\_\_

**Luther Jackson Middle School**  
**Geometry Honors Summer Packet**

**Dear Students:** The purpose of this packet is to review Algebra concepts as you look forward to Geometry Honors next year at Luther Jackson. Please show all your work for each problem. You may use a calculator for every section. This packet will be due the first week of school in September.

**Part 1: Equations of Lines**

You will find help on these topics at the following websites:

<http://regentsprep.org/Regents/math/math-topic.cfm?TopicCode=glines>

[http://www.wtamu.edu/academic/anns/mps/math/mathlab/int\\_algebra/int\\_alg\\_tut15\\_slope.htm](http://www.wtamu.edu/academic/anns/mps/math/mathlab/int_algebra/int_alg_tut15_slope.htm)

Find the slope between the two points:

1.  $(-3,4), (2, -1)$   $m=$  \_\_\_\_\_

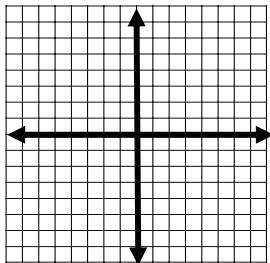
2.  $(3, 1), (-7, 1)$   $m=$  \_\_\_\_\_

Write the equation of line:

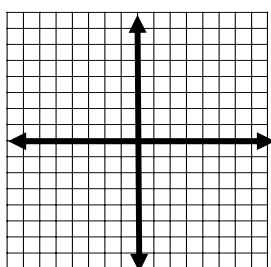
3. with slope 3 through  $(0,5)$ . \_\_\_\_\_ 4. with slope -2 through  $(5, -3)$ . \_\_\_\_\_

Graph the following lines:

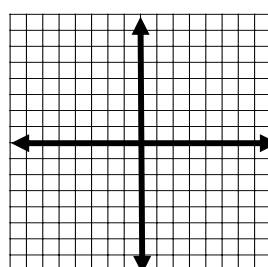
5.  $y = 2x - 1$



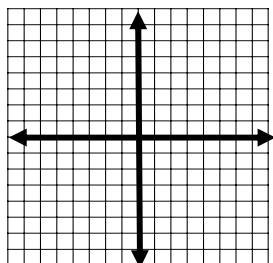
6.  $y = -\frac{1}{2}x + 2$



7.  $y = 3$



8. Write an equation of a line in **slope-intercept form** that is **perpendicular** to  $y = 4x + 2$  and passes through the point  $(1, -2)$ . \_\_\_\_\_



## Part 2: Solving Equations/Inequalities

You will find help on these topics at the following websites:

<http://regentsprep.org/Regents/math/math-topic.cfm?TopicCode=solveq>

<http://www.regentsprep.org/Regents/math/math-topic.cfm?TopicCode=syslin>

<http://www.regentsprep.org/Regents/math/math-topic.cfm?TopicCode=faceq>

1. Name the property which justifies each step.

a.)  $2(3 + d) = 6 + 2d$  \_\_\_\_\_

b.)  $a(bc) = (bc)a$  \_\_\_\_\_

c.)  $4 + (-4) = 0$  \_\_\_\_\_

d.)  $4 + (16 + 7) = (4 + 16) + 7$  \_\_\_\_\_

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2. Evaluate the expression:

a.)  $-3(2 + 4)^2 - 5 =$  \_\_\_\_\_

b.)  $(5 - 4)^3 - 2(3 - 1)^2 =$  \_\_\_\_\_

c.)  $(3x)^2 - 7y^2$ , when  $x = 3$  and  $y = 2$  \_\_\_\_\_

d.)  $\frac{x^2}{2y + 1}$  when  $x = -3$  and  $y = 2$  \_\_\_\_\_

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3. Solve the following equations:

a.)  $4(3x - 5) = -2(-x + 8)$   $x =$  \_\_\_\_\_

b.)  $4(-3x + 1) = -10(x - 4) - 14x$   $x =$  \_\_\_\_\_

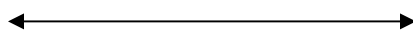
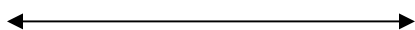
c.) Solve for  $r$ :  $C = 2\pi r$   $r =$  \_\_\_\_\_

d.) Solve for  $b$ :  $A = \frac{1}{2}bh$   $b =$  \_\_\_\_\_

4. Solve the following inequalities and graph:

a.)  $4x + 1 < 7x - 5$

b.)  $|3x + 4| \geq 2$



## Part 3: Functions

1. Tell if the following relationships are functions (Y or N).

a) 

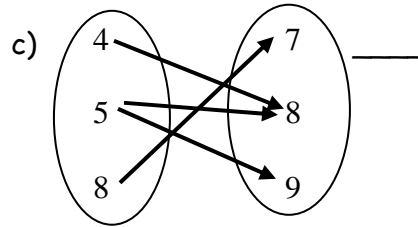
x	y
1	9
-4	1
9	9

 \_\_\_\_\_

b) 

x	y
13	3
-15	2
1	-4

 \_\_\_\_\_



2. Give the domain and range of the relation:

x	0	5	10	15	15	20	20	25	25
y	4	10	15	22	23	30	30	38	40

Domain: \_\_\_\_\_

Range: \_\_\_\_\_

Is the relation a function? \_\_\_\_\_

For numbers 3 and 4, tell whether there is a positive, negative or no correlation.

3.

x	-1	0	1	2	3	4	7
y	-6.7	-4.4	-3.1	-1.8	0.5	0.8	4.7

4.

x	2	6	11	13	19	27	34
y	243	221	195	169	145	123	101

## Part 4: Polynomials

You will find help on these topics at the following websites:

<http://www.regentsprep.org/Regents/math/math-topic.cfm?TopicCode=polymult>

[http://www.wtamu.edu/academic/anns/mps/math/mathlab/beg\\_algebra/beg\\_alg\\_tut27\\_addpoly.htm](http://www.wtamu.edu/academic/anns/mps/math/mathlab/beg_algebra/beg_alg_tut27_addpoly.htm)

Simplify

1.  $(3x^4y^3)^2$

2.  $(3x^4)(2x^5)$

3.  $\frac{4x^2y^3}{2xy^{-2}}$

4.  $(3x^2)(2x^3 - 5x + 1)$

5.  $(3x + 1)(x - 5)$

6.  $(3x + 4)^2$

7.  $(3x^2 - 4x + 5) + (5x^2 + 8x - 7)$

8.  $(3x^2 - 4x + 5) - (5x^2 + 8x - 7)$

## Part 5: Radicals

You will find help on these topics at the following websites:

<http://www.regentsprep.org/Regents/math/math-topic.cfm?TopicCode=radicals>

[http://www.mathnotes.com/Intro/aw\\_introchap8.html](http://www.mathnotes.com/Intro/aw_introchap8.html)

Simplify.

1.  $\sqrt{36}$

2.  $\sqrt{45}$

3.  $5\sqrt{12}$

4.  $\frac{1}{\sqrt{2}}$

5.  $(2\sqrt{5})(3\sqrt{2})$

6.  $(2\sqrt{5})^2$

7.  $4\sqrt{2} + 5\sqrt{2}$

8.  $\sqrt{45} + \sqrt{20}$

9.  $(3 + \sqrt{5})(3 - \sqrt{5})$

## Part 6: Systems of Equations and Inequalities

1. Solve the system.

$$3x + 4y = -3$$

$$2x + y = 8$$

2. Solve the linear system.

$$4x - 3y = -1$$

$$3x + 4y = -3$$

3. The Modern Grocery has cashews that sell for \$3.50 a pound and peanuts that sell for \$2.00 a pound. How much of each must Albert, the grocer, mix to get 60 pounds of mixture that he can sell for \$3.00 per pound. Express the problem as a system of linear equations and solve using the method of your choice to find the solution of the problem.

5. Graph the system of linear inequalities.

$$y \leq \frac{1}{2}x + 2$$

$$y \geq -\frac{1}{2}x - 2$$

$$x \leq 3$$



6. Graph the system of linear inequalities.

$$y \leq -x + 4$$

$$y \leq 2x + 4$$

$$y \geq -2$$



## Part 7: Matrix Operations

Perform the matrix operations, if possible.

$$1. \begin{pmatrix} 2 & 7 \\ -5 & 3 \end{pmatrix} + \begin{pmatrix} 2 & 4 \\ 3 & 3 \end{pmatrix}$$

$$2. \begin{pmatrix} 2 & 0 & 7 \\ -3 & 4 & 4 \\ 2 & 4 & 4 \end{pmatrix} + \begin{pmatrix} 9 & -1 \\ -3 & 2 \\ -5 & 1 \end{pmatrix}$$

Perform the matrix operations, if possible.

$$3. -8 \begin{pmatrix} 0 & 6 \\ 4 & -3 \end{pmatrix}$$

$$4. \text{ Solve for } x \text{ and } y. \begin{pmatrix} 1 & 5 \\ 3 & -2 \end{pmatrix} + \begin{pmatrix} 2 & 1 \\ -3 & 3 \end{pmatrix} = \begin{pmatrix} x & 9 \\ 3 & y \end{pmatrix}$$

## Part 8: Solving Quadratic Functions

$$1. \text{ Factor } x^2 - 169.$$

$$2. \text{ Factor } x^2 + 10x + 25.$$

$$3. \text{ Factor } x^2 - 3x + 10.$$

$$4. \text{ Factor } 9x^2 - 6x + 1.$$

$$5. \text{ Solve using the quadratic formula: } f(x) = x^2 + x - 1.$$