Name _____

Luther Jackson Middle School
Algebra 1 Honors Summer Mathematics Packet

Dear Students: *The purpose of this packet is to review algebra concepts as you look forward to Algebra 1 Honors next year at Luther Jackson. Please show all your work for each problem. You may use a calculator for every section except part 1. This packet will be due the first week of school in September.*

Part 1. Number Sense
You will find help on these topics at the following websites:

http://www.regentsprep.org/Regents/math/orderop/orderPrac.htm
http://www.regentsprep.org/Regents/math/orderop/evalPrac.htm
http://www.math.com/homeworkhelp/PreAlgebra.html

Order of Operations—Simplify each of the following mathematical expressions. These should be done without a calculator.

1) $14 \div 7 + 3^2$ 2) $42 \div 2(-12 + 9)$ 3) $\sqrt{49}$ 4) $|-14|$

5) $18 - 30 \div 5$ 6) $48 \div (5 + 7) - 9$ 7) $4^3 - 5(2) + 13$

Adding/Subtracting/Multiplying/Dividing Positive and Negative Numbers-- This is also is done without a calculator.

8) $-2 + 11 - 7$ 9) $5 - 3 + 12 - {}^{-}9$ 10) $\dfrac{-4}{\left(\frac{3}{4}\right)}$

11) $(-2)(4)(-5)(-1)$ 12) $-4 + -9 - 3(-6)$ 13) $\left(\frac{3}{5}\right)\left(-\frac{7}{12}\right)$

Evaluating Expression—you may use a calculator on this.

14) $3(n - 1) + 2n$, when $n = 5$

15) $7b - 2a$, when $a = -3$ and $b = 4$

16) $3x^2 + 5x + 1$, when $x = -2$

17) $\frac{2r}{t} + 7$, when $r = 12$ and $t = 3$

18) $(3x)^2 - 7y^2$, when $x = 3$ and $y = 2$

19) $4(3d + 6) - 2d$, when $d = -6$

Part 2: Solving Equations
You will find help on these topics at the following websites:

http://regentsprep.org/Regents/math/math-topic.cfm?TopicCode=solveq
http://www.math.com/homeworkhelp/Algebra.html

Here are some examples:

$-2y + 9 = 7$ $-9 \quad -9$ $\frac{-2y}{-2} = \frac{-2}{-2}$ $y = 1$	$2x + 3 = x + 10$ $-3 \quad -3$ $2x = x + 7$ $-x \quad -x$ $x = 7$	$3b + 2 = 6(3 - b)$ $3b + 2 = 18 - 6b$ $-2 \quad -2$ $3b = 16 - 6b$ $+6b \quad +6b$ $\frac{9b}{9} = \frac{16}{9}$ $b = 16/9$

Solve the equation.

20) $14 = b + 5$

21) $5r = 22$

22) $\frac{x}{4} = -9$

23) $3x - 5 = 13$

24) $\frac{1}{4}d + 2 = 3$

25) $-21 - 5x = 64$

26) $3y + 2y = 81 - 6$

27) $18y - 21 = 15y + 3$

28) $\frac{2a}{7} = \frac{2}{3}$

29) $2(x - 4) = 12$

30) $3(y - 4) = -2y - 12$

Properties

Match each equation on the left with the property it illustrates on the right.

31) $4 + (9 + 6) = (4 + 9) + 6$

32) $x + 12 = 12 + x$

33) $(3 + y) + 0 = 3 + y$

34) $x * 1 = x$

35) $5(x + y) = 5x + 5y$

A. Identity property of multiplication

B. Associative property of addition

C. Distributive Property

D. Identity property of addition

E. Commutative property of addition

Distributive Property

Example: $4(x + 5) = 4(x) + 4(5) = 4x + 20$

36) $3(b + 9)$

37) $5(2x - 3)$

38) $-3(4x + 9)$

39) $x(2x + 4)$ 40) $\frac{1}{2}(4r + 12)$

Part 3. Patterns, Functions, and Algebra

41. Find the **next three numbers** in the pattern.

3, 7, 11, 15, 19, _____, _____, _____

42. Find the **next three numbers** in the pattern.

1, 2, 4, 8, 16, _____, _____, _____

Use the function tables given to find the function rule.

43.

x	?_____
4	-12
5	-15
6	-18
7	-21
8	-24

x	?_____
1	1
2	4
3	7
4	10
5	13

You may get help on these and other pre-algebra skills on the following websites.

1. http://www.regentsprep.org – use the Math A site
2. http://www.math.com – use both Algebra and Pre-Algebra
3. http:// library.thinkqest.org
4. http://www.mathgoodies.com/lessons/toc_vol5.html – there are others on here, but this is the integer site
5. http://www.teacherschoice.com.au/Maths_Library/Algebra/Alg_1.htm
6. http://education.jlab.org/solquiz
7. http://w3.fiu.edu/math/cine_math/fast/pie.htm -- solving equations
8. http://www.algebrahelp.com/worksheets/