R.E.A.L. Math 1010 Supplemental Activity Name: _____
S1 Equivalence

Part I.

Objective I: Numerical expressions that have the same numerical value (the same answers) are equivalent numerical expressions.

1. Find as many expressions as you can that are equivalent to the number 4. How many are there?

2. Write as many expressions as you can that are equivalent to (7 + 4) + 5

3. **DON'T CALCULATE.** Which of the following number expressions has the same answer as:

$367 + 68 \cdot 214 \cdot 1966 + 814 \cdot 45$

a) $367 + 68 \cdot 1966 \cdot 214 + 814 \cdot 45$

b) $214 \cdot 68 \cdot 1966 + 367 + 814 \cdot 45$

c) $45 \cdot 814 + 367 + 214 \cdot 68 \cdot 1966$

d) $68 + 367 \cdot 214 \cdot 1966 + 814 \cdot 45$

e) $1966 \cdot 214 \cdot 68 + 45 \cdot 814 + 367$

f) $367 + 68 \cdot 214 \cdot 814 + 1966 \cdot 45$

4. Without calculating, insert the symbol = or ≠ between the number expressions. Give the reason(s) for your choice.

a)	(208 + 59) · 61 · 48	208 + 59 · 61 · 48
b)	(415 · 58) · (232÷ 29)	415 · 58 · 232 ÷ 29
c)	(151 + 36) + 75	151 + (36 + 75)
d)	862 – 354	354 – 862
e)	x · y · z	z · x · y

Part II.

Objective II: Algebraic expressions that are equivalent for ALL values of the variable are equivalent algebraic expressions. This is called an algebraic identity.

1. Answer the following questions for each algebraic statement.

- Are there any values for which this algebraic statement is true? Which values?
- Are there any values for which this algebraic statement is not true? Which values?
- Is this statement an algebraic identity?

a) $x + x = x^2$

b) $4x + 12 = 7x + 50$

c) $10x + 40 = 10x + 50$

2. Complete the following table.

x	Let x = 1	Let x = 2	Let x = 5	Let x = 19	Let x = 38
2x + 5x					
3x + 4x					
12x -5x					
9x – 2x					

a) What do you notice in the table?

b) Are the expressions in the table equivalent?

3. Not all algebraic expressions are algebraic identities, but can be equivalent for one or more values of the variable. Find the value of the variable that would make each pair of algebraic expressions numerically equivalent.

a) $3x + 2$ and $5x + 3$

b) $4x + 12$ and $7x + 3$

NOTE: Each pair of expressions is ***numerically equivalent*** for a specific value of the variable, but they are not ***algebraically equivalent***.

Part III. The meaning of the equal sign as relational.

1. If in a given situation y = x + 4 and y = 3x – 7 can we say x + 4 = 3x – 7 for at least one value of the variable? Why or why not?

2. If A = B and B = C, does A = C? Explain.

3. Give a definition in your own words of what the = sign means.