4A.1 **Learning Opportunity** Name: _____

Identify variable values: Proofs

Mathematical properties

Additive Identity: $a + 0 = a$ Example: $8 + 0 = 8$ Multiplicative Identity: $a(1) = a$ Example: $15(1) = 15$

Additive Inverse: $a + (-a) = 0$ Example: $9 + (-9) = 0$ Multiplicative Inverse: $a\left(\frac{1}{a}\right) = 1$ Example: $9\left(\frac{1}{9}\right) = 1$

Property of Equality: If $a = b$, then $a + c = b + c$ and $ac = bc$ Example: If $x = 5$, then $x + 2 = 5 + 2$ and $2x = 2(5)$

Substitution: If $a = b$, then a can be substituted for b, or b for a in any expression

Reflexive Property: $a = a$ Example: $9 = 9$

Construct proofs, as we did in today's notes, to identify the value of the variable in each equation below.

Please show each step of your work neatly.

Prove the identity of the variable by naming the mathematical property used for each step of your work.(Use the table above or your notes from class as a reference.)

Finally, verify the variable value you identified by substituting it back into the original equation. Again, name the mathematical property used for each step of your work.

1) $3x + 22 = 49$

Verify: $3x + 22 = 49$

2) $2y - 17 = 53$

Verify: $2y - 17 = 53$

3) $\frac{z}{3} = 21$

Verify: $\frac{z}{3} = 21$

4) $\frac{t}{5} + 12 = 14$

Verify: $\frac{t}{5} + 12 = 14$

5) $13w - 34 = 122$

Verify: $13w - 34 = 122$

6) $\frac{2}{3}x + 15 = 39$

Verify: $\frac{2}{3}x + 15 = 39$