But be careful! What is wrong with the following argument??

Theorem

Every number is equal to zero.

Proof.

- Let $x = y$;
- Multiply both sides by x to get $x^2 = xy$;
- Subtract y^2 from both sides to get $x^2 - y^2 = xy - y^2$;
- Factor both sides: $(x + y)(x - y) = y(x - y)$;
- Cancel the common factor: $x + y = y$;
- Since $x = y$ this gives $2y = y$;
- Divide both sides by y to get $2 = 1$
- Subtract 1 from both sides to get $1 = 0$
- Multiply both sides by n to get $n = 0$.

$\square$