Pedagogic vs. algebraic correctness

An equation students are expected to use in one-dimensional kinematics with constant acceleration is

$$v_f^2 - v_i^2 = 2as. \tag{1}$$

In many problems, the object is stated to be initially at rest, so

$$v_i = 0 \tag{2}$$

Suppose a student writes down

$$v_f^2 + v_i^2 = 2as. \tag{3}$$

Is this correct?

Color by numbers:	Yes: adding 0 is the same as subtracting it.
Derivability:	Yes: twice Eq. (2) squared + Eq. (1) gives Eq. (3).
All human tutors:	No: you made a sign mistake.

correctness, part 2

$$2 \times (2)^2 + (1) \Rightarrow (3)$$

Algebraic correctness is equivalent to color-by-numbers, but seems different from pedagogic correctness. Why?

The operations used to derive (3) have no motivation except to justify a pedagogically incorrect equation. Better results might come from demanding **motivated derivability** rather than **algebraic derivability**!

What exactly does that mean?

How can it be efficiently implemented?