Flipping Physics Lecture Notes:
Introductory Uniformly Accelerated Motion Problem – A Braking Bicycle

Example Problem: Mr.p is riding his bike at 22.9 km/hr when he applies the brakes causing the bike to slow down with a constant acceleration. After 1.01 seconds he has traveled 4.00 meters. (a) What was his acceleration and (b) what was his final speed?

Knowns: $v_i = 22.9\frac{km}{hr}\times\frac{1hr}{3600\sec}\times\frac{1000m}{1km} = 6.36\overline{1}\frac{m}{s}; \Delta x = 4.00m; \Delta t = 1.01s; v_f = ?; a = ?$

Part (a) $\Delta x = v_i\Delta t + \frac{1}{2}a\Delta t^2 \Rightarrow \Delta x - v_i\Delta t = \frac{1}{2}a\Delta t^2 \Rightarrow a = \frac{\Delta x - v_i\Delta t}{0.5\Delta t^2}$

$$a = \frac{4-(6.36\overline{1})(1.01)}{(0.5)(1.01)^2} = -4.75389 \approx \boxed{-4.75\frac{m}{s^2}}$$

Part (b) $v_f^2 = v_i^2 + 2a\Delta x \Rightarrow v_f = \sqrt{v_i^2 + 2a\Delta x} = \sqrt{(6.36\overline{1})^2 + (2)(-4.75389)(4.00)} = 1.55968 \approx \boxed{1.56\frac{m}{s}}$

Note: I could also have used $v_f = v_i + a\Delta t = 6.36\overline{1} + (-4.75389)(1.01) = 1.55968 \approx 1.56\frac{m}{s}$

Or even $\Delta x = \frac{1}{2}(v_f + v_i)\Delta t \Rightarrow \frac{2\Delta x}{\Delta t} = v_f + v_i \Rightarrow \frac{2\Delta x}{\Delta t} - v_i = v_f$

$\Rightarrow v_f = \frac{(2)(4)}{1.01} - 6.36\overline{1} = 1.55968 \approx 1.56\frac{m}{s}$ & gotten the same answer, again.

The reason there are 3 equations we could use is because after we have solved part (a) we now know four of the UAM variables and not just 3.

Hopefully Helpful Definitions:
Perspicacious (adjective): having or showing an ability to notice and understand things that are difficult or not obvious.
ilk (noun): a type of people or things similar to those already referred to.
Pedantic (adjective): of or like a pedant.
Pedant (noun): a person who is excessively concerned with minor details and rules or with displaying academic learning.