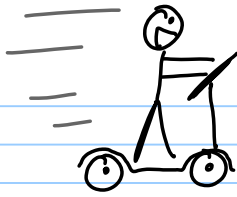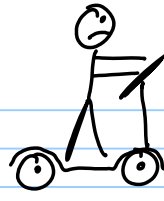A student on the Physics scooter is cruising along at 5.4 m/s. They hit the brakes and come to a stop in 4.6 m.

a. Find the acceleration of the scooter while braking.

b. How much time did it take to come to a stop?

$V_0 = 5.4 \, m/s$ $V = 0$

a.)

$V = 0$

$V_0 = 5.4 \, m/s$

$a = \, ?$

$d = 4.6 \, m$

$t =$

$V^2 = V_0^2 + 2ad$ ✓

$-V_0^2 \quad -V_0^2$

$\dfrac{V^2 - V_0^2}{2d} = \dfrac{2ad}{2d}$

$a = \dfrac{V^2 - V_0^2}{2d}$

$= \dfrac{0^2 - 5.4^2}{2(4.6)}$

$= -3.170 \, m/s^2$

$= \boxed{-3.2 \, m/s^2}$ ✓

b.

$V = V_0 + at$ ✓

$-V_0 \quad -V_0$

$\dfrac{V - V_0}{a} = \dfrac{at}{a}$

$t = \dfrac{V - V_0}{a} = \dfrac{0 - 5.4}{-3.170} = \boxed{1.7 \, s}$ ✓