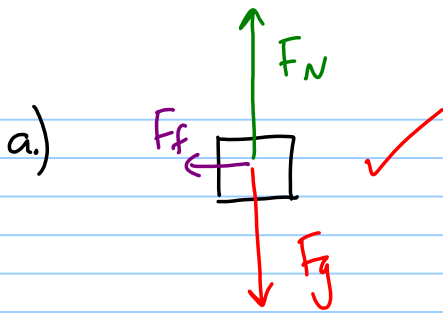A student shoves a 9.6 kg wooden box with an initial speed of 4.8 m/s. The box slides 1.4 m before stopping.

a. Draw a free body diagram of the box while it is stopping.

b. What is the coefficient of friction between the box and the floor?

a.)

b.)

$v = 0$
$v_0 = 4.8 \, m/s$
$a = \, ?$
$d = 1.4 \, m$
$t =$

$v^2 = v_0^2 + 2ad$

$a = \dfrac{v^2 - v_0^2}{2d}$

$= \dfrac{0^2 - 4.8^2}{2(1.4)}$

$= -8.2286 \, m/s^2$

$F_{net} = -F_f = ma$

$F_f = -(9.6 \, kg)(-8.2286 \, N/kg)$

$= 78.99 \, N$

$F_f = \mu F_N$

$= \mu mg$

$\mu = \dfrac{F_f}{mg} = \dfrac{78.99 \, N}{(9.6 \, kg)(9.8 \, N/kg)}$

$= \boxed{0.84}$