Units

x — distance
t — time
v — velocity
m — mass
F — force

Determine SI units of Constants

① $x^2 = c_1^2 t + c_2 t^2$

$[x^2] = [c_1^2 t + c_2 t^2]$ $[LHS] = [RHS]$

$[x^2] = [c_1^2 t]$ ⓐ

$[x^2] = [c_2 t^2]$ ⓑ

ⓐ $m^2 = [c_1^2] s \Rightarrow [c_1^2] = \frac{m^2}{s} \Rightarrow [c_1] = \sqrt{\frac{m^2}{s}} = \frac{m}{\sqrt{s}}$

ⓑ $m^2 = [c_2] s^2 \Rightarrow [c_2] = \frac{m^2}{s^2}$

② $v \cdot x = \frac{1}{2} c_1^2 t^2 + 2 c_2 \cdot x^2$

$[vx] = [\frac{1}{2} c_1^2 t^2 + 2 c_2 x^2]$

$[vx] = [c_1^2 t^2]$ ⓐ

$[vx] = [c_2 x^2]$ ⓑ

(a) $\frac{m}{s}m = [C_1^2]s^2 \Rightarrow [C_1^2] = \frac{m^2}{s^3} \Rightarrow [C_1] = \frac{m}{s^{3/2}}$

(b) $\frac{m}{s}m = [C_2]m^2 \Rightarrow [C_2] = \frac{1}{s} = s^{-1}$