$$= \frac{-\frac{1}{16}(x^2+2x-3) + \frac{1}{4}(x+3) + \frac{1}{16}(x^2-2x+1)}{(x-1)^2(x+3)}$$

$$= \frac{x^2\left(-\frac{1}{16}+\frac{1}{16}\right) + x\left(-\frac{2}{16}+\frac{4}{16}-\frac{2}{16}\right) + \left(\frac{3}{16}+\frac{12}{16}+\frac{1}{16}\right)}{(x-1)^2(x+3)}$$

$$= \frac{0+0+1}{(x-1)^2(x+3)} = \frac{1}{(x-1)^2(x+3)}$$

Integral becomes

$$\int_0^t dt = \int_2^x \frac{-\frac{1}{16}}{(x-1)} + \frac{\frac{1}{4}}{(x-1)^2} + \frac{\frac{1}{16}}{(x+3)}\, dx$$

$$\therefore t = \left[\frac{-1}{16}\ln(x-1) - \frac{1}{4(x-1)} + \frac{\ln(x+3)}{16}\right]_2^x$$

$$= \left[\frac{1}{16}\ln\left(\frac{x+3}{x-1}\right) - \frac{1}{4(x-1)}\right]_2^x$$

$$= \left(\frac{1}{16}\ln\left(\frac{x+3}{x-1}\right) - \frac{1}{4(x-1)}\right) - \left(\frac{1}{16}\ln\left(\frac{2+3}{2-1}\right) - \frac{1}{4(2-1)}\right)$$

$$= \frac{1}{16}\ln\left(\frac{x+3}{x-1}\right) - \frac{1}{4(x-1)} - \frac{1}{16}\ln(5) + \frac{1}{4}$$

$$= \frac{1}{16}\ln\left(\frac{x+3}{5(x-1)}\right) - \frac{1}{4(x-1)} + \frac{1}{4}$$

$$= \frac{1}{16}\ln\left(\frac{x+3}{5(x-1)}\right) + \frac{1}{4}\left(1 - \frac{1}{x-1}\right)$$

$$t = \frac{1}{16}\ln\left(\frac{x+3}{5(x-1)}\right) + \frac{1(x-2)}{4(x-1)}$$

Motion terminates if x reaches infinity at some finite time: if $x \to \infty$

$$\frac{x+3}{5(x-1)} \to \frac{1}{5}, \quad \frac{1(x-2)}{4(x-1)} \to \frac{1}{4}$$

$$\therefore t = \frac{1}{16}\ln(1/5) + 1/4$$

≈ 0.1494 time units, which is certainly finite $\therefore$ the motion terminates