

Root Finding

The velocity of a falling parachutist is given by

$$v = \frac{gm}{c} (1 - e^{-(c/m)t})$$

where $g = 9.8 \text{ m/s}^2$. For the parachutist with a drag coefficient $c = 15 \text{ kg/s}$, compute the mass " m " so that the velocity is $v = 35 \text{ m/s}$ at $t = 9 \text{ sec}$. Use the false-position method to determine " m " to a level of $\epsilon_a = 0.1\%$. Start with an initial bracket of $[50 \text{ kg}, 70 \text{ kg}]$.

Also try to solve the problem using Newton-Raphson with an initial guess of 70 kg .