

## Numerical Integration - Air Resistance

Suppose that the upward force of air resistance on a falling object is proportional to the square of its velocity. For this case, velocity can be computed as:

$$v(t) = \sqrt{\frac{g \cdot m}{c_d}} \tanh\left(\sqrt{\frac{g c_d}{m}} t\right)$$

For this problem:

$$g = 9.8 \text{ m/s}^2, \quad m = 68.1 \text{ kg}, \quad c_d = 0.25 \text{ kg/m}$$

Using the multiple segment trapezoidal rule, evaluate the integral to  $n = 4$  to determine how far the object falls in 10 s.