Sonntag, 18. April 2021 12:12

Aufgabe 2

a) $m = 10\,kg$ $a = 20\,m/s$ $R(v) = -v\sqrt{v}$

$n = 5$ $b = 5\,m/s$ $f(x) = \frac{m}{R(v)}$

$$Rf(h) = h \cdot \sum_{i=0}^{n-1} f\left(x_i + \frac{h}{2}\right)$$

$$h = \frac{b-a}{n} = \frac{5\,m/s - 20\,m/s}{5} = -3\,m/s$$

$$X = [20\,m/s,\ 17\,m/s,\ 14\,m/s,\ 11\,m/s,\ 8\,m/s,\ 5\,m/s]$$

$$\sum_{i=0}^{n-1} f\left(x_i + \frac{h}{2}\right) = -1,9027$$

$$Rf(h) = -3 \cdot -1,9027 = \underline{\underline{5,7081}}$$

b) $m = 10\,kg$ $a = 20\,m/s$ $R(v) = -v\sqrt{v}$

$n = 5$ $b = 5\,m/s$ $f(x) = \frac{m}{R(v)}$

$$Tf(h) = h \cdot \left(\frac{f(a) + f(b)}{2} + \sum_{i=1}^{n-1} f(x_i)\right)$$

$$h = \frac{b-a}{n} = \frac{5\,m/s - 20\,m/s}{5} = -3\,m/s$$

$$X = [20\,m/s,\ 17\,m/s,\ 14\,m/s,\ 11\,m/s,\ 8\,m/s,\ 5\,m/s]$$

$$\sum_{i=1}^{n-1} f(x_i) = \frac{10\,kg}{R(x_i)} = -0,44194\,\frac{kg}{m/s}$$

$$\sum_{i=1} f(x_i) = \frac{\cdots}{R(x_i)} = -0{,}44194 \ \%/m/s$$

$$\frac{f(a)+f(b)}{2} = \frac{f(20\ m/s) + f(5\ m/s)}{2} = 0{,}503715\ m/s$$

$$-3 \cdot \left(0{,}503711 - 0{,}441194 \right) = -0{,}185$$