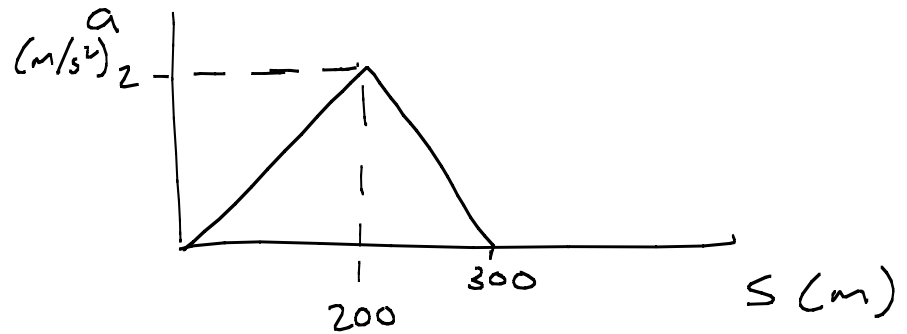


Problem 1

Given: - $a-s$ graph
- $v=0$ when $s=0$

Determine: $v-s$



$$a ds = v dv$$

For $0 < s < 200$

$$a = \frac{1}{100} s$$

$$\int_0^s \frac{1}{100} s ds = \int_0^v v dv$$

$$\frac{1}{200} s^2 = \frac{1}{2} v^2$$

$$\frac{1}{100} s^2 = v^2$$

$$v = \frac{1}{10} s$$



For $200 < s < 300$

$$a = -\frac{1}{50}s + 6$$

$$\int_{200}^s \left(-\frac{1}{50}s + 6\right) ds = \int_{v|_{s=200m}}^v v dv$$

$$v|_{s=200m} = \frac{1}{10}(200) = 20 \text{ m/s}$$

$$\int_{200}^s \left(-\frac{1}{50}s + 6\right) ds = \int_{20}^v v dv$$

$$\left[-\frac{1}{100}s^2 + 6s\right]_{200}^s = \frac{1}{2}v^2 - \frac{1}{2}(20)^2$$

$$v = \sqrt{-\frac{1}{50}s^2 + 12s - 1200} \text{ m/s}$$