

1. My ID = 18101094

$$t = 94 + 10 = 104$$

Find velocity at $t = 104$ second
using newton divided difference
method for quadratic interpolation.

$$t_0 = 65.75; \quad v(t_0) = 1902.249$$

$$t_1 = 95.5; \quad v(t_1) = 2799.901$$

$$t_2 = 125.25; \quad v(t_2) = 3697.553$$

$$b_0 = v(t_0) = 1902.249$$

$$v(t_1) - v(t_0)$$

$$b_1 = \frac{v(t_1) - v(t_0)}{t_1 - t_0}$$

$$\frac{2799.901 - 1902.249}{95.5 - 65.75}$$

$$= \frac{897.652}{29.75}$$

$$= \frac{2799.901 - 1902.249}{1.04 - 1.01} = \frac{897.652}{0.03} = 29.9217$$

$$= \frac{897.652}{29.9217} = 30.17$$

$$b_2 = \frac{v(t_2) - v(t_1)}{t_2 - t_1} - \frac{v(t_1) - v(t_0)}{t_1 - t_0}$$

$$= \frac{3697.553 - 2799.901}{125.25 - 95.5} - \frac{2799.901 - 1902.249}{95.5 - 65.75}$$

$$= \frac{897.652}{29.75} - 30.17 = 59.5$$

$$= \frac{30.17 - 30.17}{59.5}$$

$$= 0.$$

$$\begin{aligned} v(t) &= b_0 + b_1(t - t_0) + b_2(t - t_0)(t - t_1) \\ &= 1902.249 + 30.17(t - 65.75) + 0 \\ &\quad (t - 65.75)(t - 30.75) \end{aligned}$$

$$\begin{aligned} v(104) &= ~~1004~~ 1902.249 + 30.17 \\ &\quad (104 - 65.75) + 0 \end{aligned}$$

$$= ~~2958~~ 3056.2515$$