

1. Complete derivation:

a. For a_i in linear interpolation

$$g_i = a_i(x - x_i) + b_i$$

From video: $b_i = y_i$

Plug in $x = x_{i+1}$

$$y_{i+1} = a_i(x_{i+1} - x_i) + y_i$$

$$y_{i+1} - y_i = a_i(x_{i+1} - x_i)$$

$$\boxed{a_i = \frac{y_{i+1} - y_i}{x_{i+1} - x_i}}$$