

$$Y_{2233} = \text{FLINE}(X_2, Y_{123}, X_3, Y_{234}, X)$$

$$Y_{2233} = \frac{Y_{123}(X_3 - X) + Y_{234}(X - X_2)}{X_3 - X_2}$$

$$= \left[\frac{Y_{12}(X_3 - X) + Y_{23}(X - X_1)}{(X_3 - X_1)(X_3 - X_2)} \right] (X_3 - X) \\ + \left[\frac{Y_{23}(X_4 - X) + Y_{34}(X - X_2)}{(X_3 - X_2)(X_4 - X_2)} \right] (X - X_2)$$

$$Y_{2233} = Y_{12} \left[\frac{(X_3 - X)(X_3 - X)}{(X_3 - X_1)(X_3 - X_2)} \right] \\ + Y_{23} \left[\frac{(X - X_1)(X_3 - X)}{(X_3 - X_1)(X_3 - X_2)} + \frac{(X_4 - X)(X - X_2)}{(X_4 - X_2)(X_3 - X_2)} \right] \\ + Y_{34} \left[\frac{(X - X_2)(X - X_2)}{(X_3 - X_2)(X_4 - X_2)} \right]$$

$$\begin{aligned}
\frac{dY_{2233}}{dx} &= \left[\frac{(x_3-x)(x_3-x)}{(x_3-x_1)(x_3-x_2)} \right] \left[\frac{Y_2-Y_1}{x_2-x_1} \right] \\
&+ \left[\frac{Y_1(x_2-x)+Y_2(x-x_1)}{x_2-x_1} \right] \left[\frac{x-x_3+x-x_3}{(x_3-x_1)(x_3-x_2)} \right] \\
&+ \left[\frac{Y_3-Y_2}{x_3-x_2} \right] \left[\frac{(x-x_1)(x_3-x)}{(x_3-x_1)(x_3-x_2)} + \frac{(x_4-x)(x-x_2)}{(x_4-x_2)(x_3-x_2)} \right] \\
&+ \left[\frac{Y_2(x_3-x)+Y_3(x-x_2)}{x_3-x_2} \right] \left[\frac{x_3-x-x+x_1}{(x_3-x_1)(x_3-x_2)} + \frac{x_4-x-x+x_2}{(x_4-x_2)(x_3-x_2)} \right] \\
&+ \left[\frac{Y_4-Y_3}{x_4-x_3} \right] \left[\frac{(x-x_2)(x-x_2)}{(x_3-x_2)(x_4-x_2)} \right] \\
&+ \left[\frac{Y_3(x_4-x)+Y_4(x-x_3)}{x_4-x_3} \right] \left[\frac{x-x_2+x-x_2}{(x_3-x_2)(x_4-x_2)} \right]
\end{aligned}$$

$$\begin{aligned}
 \frac{dY_{2233}}{dx} \Big|_{x=x_2} &= \left[\frac{Y_2 - Y_1}{x_2 - x_1} \right] \left[\frac{(x_3 - x_2)(x_3 - x_2)}{(x_3 - x_1)(x_3 - x_2)} \right] \\
 &\quad - \frac{2Y_2 (x_3 - x_2)}{(x_3 - x_1)(x_3 - x_2)} \\
 &\quad + \left[\frac{Y_3 - Y_2}{x_3 - x_2} \right] \left[\frac{(x_2 - x_1)(x_3 - x_2)}{(x_3 - x_1)(x_3 - x_2)} \right] \\
 &\quad + Y_2 \frac{(x_3 - x_2)}{x_3 - x_2} \left[\frac{x_1 + x_3 - 2x_2}{(x_3 - x_1)(x_3 - x_2)} + \frac{1}{x_3 - x_2} \right]
 \end{aligned}$$

$$\begin{aligned}
 \frac{dY_{2233}}{dx} \Big|_{x=x_2} &= \left[\frac{Y_2 - Y_1}{x_2 - x_1} \right] \left[\frac{(x_3 - x_2)(x_3 - x_2)}{(x_3 - x_1)(x_3 - x_2)} \right] \\
 &\quad + \left[\frac{Y_3 - Y_2}{x_3 - x_2} \right] \left[\frac{(x_2 - x_1)(x_3 - x_2)}{(x_3 - x_1)(x_3 - x_2)} \right]
 \end{aligned}$$

$$\begin{aligned}
\frac{dY_{2233}}{dx} &= \left[\frac{Y_2(x_3 - x_2) - Y_1(x_3 - x_2) + Y_3(x_2 - x_1) - Y_2(x_2 - x_1)}{x_3 - x_1} \right] \\
&= \frac{\left[\frac{Y_1(x_2 - x_3) + Y_2(x_3 - x_2)}{x_2 - x_1} \right] - \left[\frac{Y_2(x_2 - x_1) + Y_3(x_1 - x_2)}{x_3 - x_2} \right]}{x_3 - x_1} \\
&= \frac{FLINE(x_1, Y_1, x_2, Y_2, x_3) - FLINE(x_2, Y_2, x_3, Y_3, x_1)}{x_3 - x_1} \\
&= \frac{Y_{12@3} - Y_{23@1}}{x_3 - x_1}
\end{aligned}$$