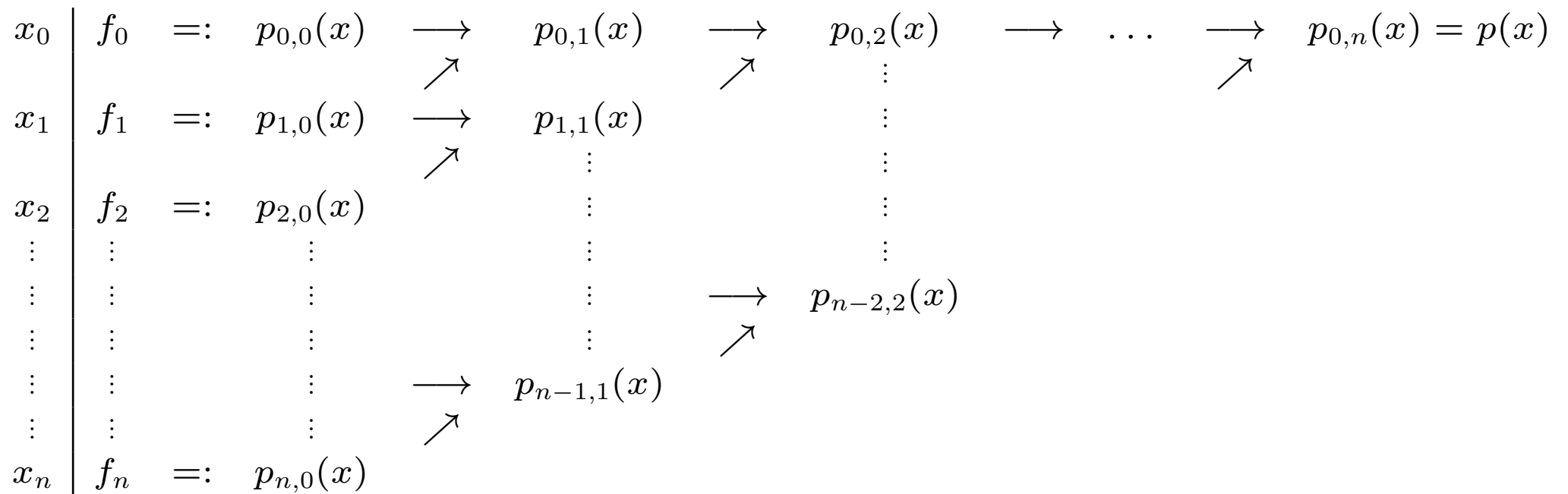


Neville scheme

$$p_{i,0}(x) = f_i \qquad i = 0, \dots, n$$

$$p_{i,m}(x) = \frac{(x - x_i)p_{i+1,m-1}(x) - (x - x_{i+m})p_{i,m-1}(x)}{x_{i+m} - x_i}, \quad i = 0, \dots, n - m, \quad m = 1, \dots, n$$



Neville Scheme (example)

given:

$$(x_0, f_0) = (0, 1) \quad (x_1, f_1) = (1, 3) \quad (x_2, f_2) = (3, 2)$$

sought: value of interpolating polynomial at $x = 2$

starting values of Neville scheme (1. column):

$$p_{0,0}(2) = f_0 = 1$$

$$p_{1,0}(2) = f_1 = 3$$

$$p_{2,0}(2) = f_2 = 2$$

second step (2. column):

$$p_{0,1}(2) = \frac{(2-0)p_{1,0}(2) - (2-1)p_{0,0}(2)}{1-0} = 2 \cdot 3 - 1 \cdot 1 = 5$$

$$p_{1,1}(2) = \frac{(2-1)p_{2,0}(2) - (2-3)p_{1,0}(2)}{3-1} = \frac{1 \cdot 2 - (-1) \cdot 3}{2} = \frac{5}{2}$$

result (3. column):

$$\boxed{p_{0,2}(2)} = \frac{(2-0)p_{0,1}(2) - (2-3)p_{1,1}(2)}{3-0} = \frac{2 \cdot \frac{5}{2} - (-1) \cdot 5}{3} = \boxed{\frac{10}{3}}$$