Suppose there exists a polynomial $P(x)$ of degree $n-1$. This polynomial can be expressed in two ways:

1. **Coefficient form**: $a_0 + a_1 x + a_2 x^2 + \cdots + a_{n-1} x^{n-1}$.
2. **Point-value form**: $(x_1, y_1), (x_2, y_2), \ldots, (x_n, y_n)$.

We can convert from point-value form to coefficient form (and thus evaluate $P(x)$ at arbitrary points), provided we have n distinct points, using the following formula:

$$P(x) = \sum_{j=1}^{n} P_j(x), \qquad P_j(x) = y_j \prod_{\substack{k=1 \\ k \neq j}}^{n} \frac{x - x_k}{x_j - x_k}.$$