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ermined and must satisfy the following: For example,

$$\det\begin{pmatrix} d_f(z)\, g(A_1(z)), & f(A_1(z))^{\nu-2}, & \cdots & 1 \\ \\ \\ d_f(z)\, g(A_\nu(z)), & f(A_\nu(z))^{\nu-2}, & \cdots & 1 \end{pmatrix} = \det\begin{pmatrix} a_1(z) f(A_1(z))^{\nu-1} + \cdots + c_{\nu-1}(z), & f(A_1(z))^{\nu-2}, & \cdots & 1 \\ \\ \\ a_1(z) f(A_\nu(z))^{\nu-1} + \cdots + c_{\nu-1}(z), & f(A_\nu(z))^{\nu-2}, & \cdots & 1 \end{pmatrix}$$

$$= a_1(z) \det\begin{pmatrix} f(A_1(z))^{\nu-1}, & f(A_1(z))^{\nu-2}, & \cdots & 1 \\ \vdots \\ f(A_\nu(z))^{\nu-1}, & f(A_\nu(z))^{\nu-2}, & \cdots & 1 \end{pmatrix}$$

$$a_k(z) \det\{ f(A_j(z))^{\nu-1}, \cdots f(A_j(z)), 1\}$$

$$= \det\{ f(A_j(z))^{\nu-1}, \cdots f(A_j(z))^{\nu-k+1}, d_f(z)\, g(A_j(z)), f(A_j(z))^{\nu-k-1}, \cdots 1\}$$

where in each determinant only the jth row is written out. The determinant on the left-hand side of this equation is the van der Monde determinant $\Delta(z)$, and it is a familiar result from elementary algebra that $\Delta(z)^2 = d_f(z)$. Hence, factoring $d_f(z)$ out of the determinant on the right-hand side and dividing by $\Delta(z)$ lead to

$$a_k(z) = \Delta(z) \cdot \det\{ f(A_j(z))^{\nu-1}, \cdots, g(A_j(z)), f(A_j(z))^{\nu-k-1}, \cdots 1\}.$$

Both $\Delta(z)$ and $\det\{\ \}$ change signs upon interchanging