

A Higher Minors Experiment

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9:06 PM

α β_1 β_2
 γ_1 δ_{11} δ_{12}
 γ_2 δ_{21} δ_{22}
 starting A

$$\frac{1}{w^2} \begin{vmatrix} (w+\alpha)\delta_{11} - \gamma_1\beta_1 & (w+\alpha)\delta_{12} - \gamma_1\beta_2 \\ (w+\alpha)\delta_{21} - \gamma_2\beta_1 & (w+\alpha)\delta_{22} - \gamma_2\beta_2 \end{vmatrix} =$$

$$\frac{1}{w^2} \left[-\gamma_1(w+\alpha) \begin{vmatrix} \beta_1 & \beta_2 \\ \delta_{21} & \delta_{22} \end{vmatrix} - \gamma_2(w+\alpha) \begin{vmatrix} \delta_{11} & \delta_{12} \\ \beta_1 & \beta_2 \end{vmatrix} + (w+\alpha)^2 \begin{vmatrix} \delta_{11} & \delta_{12} \\ \delta_{21} & \delta_{22} \end{vmatrix} \right]$$

$$= \frac{w+\alpha}{w^2} \left[\underbrace{w \begin{vmatrix} \delta_{11} & \delta_{12} \\ \delta_{21} & \delta_{22} \end{vmatrix}}_{\text{divisible by } w} + \underbrace{\begin{vmatrix} \alpha & \beta_1 & \beta_2 \\ \gamma_1 & \delta_{11} & \delta_{12} \\ \gamma_2 & \delta_{21} & \delta_{22} \end{vmatrix}}_{\text{div by } w^2} \right]$$

div by w^2 div by w^2

div by $w+\alpha$.

$$\frac{1}{w^2} \left[w^2 \begin{vmatrix} \delta_{11} & \delta_{12} \\ \delta_{21} & \delta_{22} \end{vmatrix} + w \begin{vmatrix} \delta_{11} & \alpha\delta_{12} - \gamma_1\beta_2 \\ \delta_{21} & \alpha\delta_{22} - \gamma_2\beta_2 \end{vmatrix} + \right.$$

$$\left. + w \begin{vmatrix} \alpha\delta_{11} - \gamma_1\beta_1 & \delta_{12} \\ \alpha\delta_{21} - \gamma_2\beta_1 & \delta_{22} \end{vmatrix} + \begin{vmatrix} \alpha\delta_{11} - \gamma_1\beta_1 & \alpha\delta_{12} - \gamma_1\beta_2 \\ \alpha\delta_{21} - \gamma_2\beta_1 & \alpha\delta_{22} - \gamma_2\beta_2 \end{vmatrix} \right]$$

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