

HW 2

$$\begin{bmatrix} -n & 1 \\ -n^2 - n + 1 & n+1 \end{bmatrix} \begin{bmatrix} \frac{1}{n^2} & \frac{1}{n} + \frac{1}{n^3} \\ \frac{1}{n^2} & \frac{1}{n^2} \end{bmatrix} = \begin{bmatrix} -\frac{n^3}{n^2} + \frac{1}{n^2} & -n\left(-\frac{1}{n} + \frac{1}{n^3}\right) + \frac{1}{n^2} \\ -\frac{n^3}{n^2} \cdot \frac{n}{n^3} + \frac{1}{n^3} + \frac{1}{n^2}(n+1) & \left(-\frac{1}{n} + \frac{1}{n^3}\right) \cdot (n^2 - n + 1) + \frac{n+1}{n^2} \end{bmatrix}$$

$$= \begin{bmatrix} \cancel{-\frac{n^3}{n^2}} + \frac{1}{n^2} & \cancel{-\frac{n^3}{n^2}} + \frac{1}{n^2} \\ \cancel{-\frac{n^3}{n^2}} + \frac{1}{n^3} + \frac{1}{n^2}(n+1) & \cancel{-\frac{n^3}{n^2}} + \frac{1}{n^2} \end{bmatrix}$$

$$\frac{1}{n^2} + \frac{n}{n} - \frac{1}{n} - \frac{n^2}{n^3} - \frac{n}{n^2} + \frac{1}{n^3} + \frac{n}{n^2} + \frac{1}{n^2}$$

$$n+1 - \frac{1}{n^2} + \frac{1}{n^3}$$

$$= \begin{bmatrix} 0 & 1 \\ \frac{1}{n^3} & n+1 - \frac{1}{n^2} + \frac{1}{n^3} \end{bmatrix}$$

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