

Throughout the course, we will use **EK** to refer to the course textbook “Erwin Kreyszig: *Advanced Engineering Mathematics*, 10th edition.”

Problems to be turned in:

EK:

P329: 3, 13

P318: 17, 19, 21, 22

P308: 2, 6, 8 (use the method of adjoint matrices)

P308: 15

P338: 3, 16, 17

Additional problems:

1. Prove the result: For $A \in \mathbb{R}^{m \times n}$ and $B \in \mathbb{R}^{n \times m}$,

$$\det(I_m + AB) = \det(I_n + BA)$$

where I_m and I_n are the $m \times m$ and $n \times n$ identity matrices, respectively.

2. Prove the result: Assume A is nonsingular and we want to get $(A + BC)^{-1}$. The following is true

$$(A + BC)^{-1} = A^{-1} \left(I - B (CA^{-1}B + I)^{-1} CA^{-1} \right) \quad (1)$$