

Problem Solving

Set 20

23 July 2012

1. A, B are square complex matrices and $\text{rank}(AB - BA) = 1$.
Show that $(AB - BA)^2 = 0$.
2. Consider the equation

$$f'(x) = f(x + 1).$$

Is there a solution with $f(x) \rightarrow \infty$ as $x \rightarrow \infty$?