MAT 310: HW6

(1) Let V denote a vector space over the field F; let $T : V \longrightarrow V$ denote a linear transformation; let A denote a matrix in $M_{n\times n}(F)$. Then $f(T)$ and $f(A)$ have been defined on page 565 of our text book.

Prove Theorem E.3 on page 566 of the text book.

(2) Do problems #2,3ac,4ab,6,10,11 in section 2.7.

(3) Let T, f, A be as in problem (1) above. Suppose that $f(x) = g(x)h(x)$, where $g(x)$ and $h(x)$ are both in $P(F)$. Then show that $f(T) = g(T)h(T)$ and $f(A) = g(A)h(A)$. (**Note:** $g(x)h(x)$ denotes the product of the polynomial $g(x)$ and $h(x)$; $g(A)h(A)$ denotes the product of the matrices $g(A)$ and $h(A)$; and $g(T)h(T)$ denotes the composition of the linear map $g(T) : V \longrightarrow V$ with the linear map $h(T) : V \longrightarrow V$.)

(4) Do problems #1,2,3c,5,6,7 in section 3.1.