MATH 2P13, Winter, 2018

ASSIGNMENT #3

Due 4pm, Friday, March 16, 2018

1. Let $A = \begin{bmatrix} 2 & 4 & 1 \\ 5 & -7 & -1 \\ 11 & 5 & 4 \end{bmatrix}$, and $B = \begin{bmatrix} 2 & 4 & 1 \\ 5 & -7 & -1 \\ 0 & 0 & 1 \end{bmatrix}$. Find elementary matrices E_1, E_2, and E_3

   such that $E_3 E_2 E_1 A = B$.

2. Find the value of k that satisfies the following equation.

$$\det \begin{bmatrix} 3a_1 & 3a_2 & 3a_3 \\ 5b_1 + 6c_1 & 5b_2 + 6c_2 & 5b_3 + 6c_3 \\ 4a_1 + 7c_1 & 4a_2 + 7c_2 & 4a_3 + 7c_3 \end{bmatrix} = k \det \begin{bmatrix} a_1 & a_2 & a_3 \\ b_1 & b_2 & b_3 \\ c_1 & c_2 & c_3 \end{bmatrix}.$$

The following questions are referred to the text book.

Sec. 4.3, # 12, 24, 26(d).
Sec. 5.1, # 2(c),(d), 3(c), 4(f), 5, 12(a).
Sec. 5.2 # 3(d), 4, 7(Hint: first find a matrix Q such that
$Q^{-1}AQ = D$ **a diagonal matrix, then** $A = QDQ^{-1}$, **and** $A^n = QD^nQ^{-1}$**).**

Additional Practice Exercises. Not To Be Submitted.

Sec. 4.3 # 14, 15, 16, 17, 20, 21, 22(a).
Sec. 5.1, #2 (a), (b), 3 (b), 4(c), (d), 9, 11, 14, 15.
Sec. 5.2, # 3(b),(c), 8, 9, 10.