ANSWERS TO PROBLEMS FROM HOMEWORK 4

1.5 #2, 3, 5b, 6abe, 7c, 10, 11, 13

② a) $\begin{bmatrix} 1 & 0 \\ -5 & 1 \end{bmatrix} \rightarrow \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

ADD 5① to ②

b) $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 3 \end{bmatrix} \rightarrow \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

MULT ③ by $\frac{1}{3}$

c) $\begin{bmatrix} 0 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 \end{bmatrix} \rightarrow \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$

INTERCHANGE ① and ④

d) $\begin{bmatrix} 1 & 0 & -\frac{1}{7} & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix} \rightarrow \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$

ADD $\frac{1}{7}$③ to ①

③ a) $E_1 = \begin{bmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{bmatrix}$

INTERCHANGE ① and ③

b) $E_2 = \begin{bmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{bmatrix}$

INTERCHANGE ① and ③

c) $E_3 = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ -2 & 0 & 1 \end{bmatrix}$

ADD -2① to ③

d) $E_4 = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 2 & 0 & 1 \end{bmatrix}$

ADD 2① to ③

⑤ b) $\begin{bmatrix} -3 & 6 & | & 1 & 0 \\ 4 & 5 & | & 0 & 1 \end{bmatrix} \rightarrow \begin{bmatrix} -3 & 6 & | & 1 & 0 \\ 1 & 11 & | & 1 & 1 \end{bmatrix} \rightarrow \begin{bmatrix} 1 & -2 & | & -\frac{1}{3} & 0 \\ 0 & 13 & | & \frac{4}{3} & 1 \end{bmatrix}$

ADD ① to ②   ADD -4① to ②

$\rightarrow \begin{bmatrix} 1 & -2 & | & -\frac{1}{3} & 0 \\ 0 & 1 & | & \frac{4}{39} & \frac{1}{13} \end{bmatrix} \rightarrow \begin{bmatrix} 1 & 0 & | & -\frac{5}{39} & \frac{2}{13} \\ 0 & 1 & | & \frac{4}{39} & \frac{1}{13} \end{bmatrix}$

MULT ② by $\frac{1}{13}$ ADD 2② to ①

check: $\begin{bmatrix} -3 & 6 \\ 4 & 5 \end{bmatrix} \begin{bmatrix} -\frac{5}{39} & \frac{2}{13} \\ \frac{4}{39} & \frac{1}{13} \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ ✓✓