

Sect 2.3
Answer key

1. Invertible
det $\neq 0$
2. not invertible
det = 0
3. invertible
3 pivots
4. not invertible
b/c columns dependent
5. not invertible
only 2 pivots
6. not invertible
only 2 pivots
7. Invertible
4 pivots
8. invertible
4 pivots
9. the 4×4 matrix has
4 pivots, so it's invertible
by the IMT
10. Invertible
5 pivots
11. a) T
b) T
c) F
d) T
e) T
12. a) T
b) T
c) T
d) F
e) T
13. invertible only if
all diagonal elements
are non-zero
14. Same reason
as #13
15. 2 identical columns
are Lin. dependent
 \Rightarrow not invertible
16. No
17. If A invertible
then A^{-1} invertible
 \Rightarrow columns of A^{-1}
are Lin. independent
20. by IMT, E & F are invertible & inverses
 $\Rightarrow EF = I = FE$
thus, they commute
27. Let $W = (AB)^{-1}$
 $\Rightarrow ABW = I$
 $\Rightarrow A(BW) = I$
doesn't mean A invertible
b/c what if A is 2×3
& B is 3×2
then AB is 2×2 & invertible
but A not invertible
33. $A = \begin{bmatrix} -5 & 9 \\ 4 & -7 \end{bmatrix} \Rightarrow A^{-1} = \frac{1}{-35 - 36} \begin{bmatrix} 7 & 9 \\ 4 & 5 \end{bmatrix}$
So $T^{-1}(\bar{x}) = A^{-1}\bar{x}$
34. $A = \begin{bmatrix} 6 & -8 \\ -5 & 7 \end{bmatrix} \Rightarrow A^{-1} = \frac{1}{42 - 40} \begin{bmatrix} 3.5 & 4 \\ 2.5 & 3 \end{bmatrix}$
so $T^{-1}(\bar{x}) = A^{-1}(\bar{x})$

35.

~~see handouts page~~

see handouts page