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3.2 Homework

1. $A \to B$ (swap rows) then $\det B = -\det A$

2. No change → row replacement operation

3. Thm 3(c) $\det(M) = k\det(N)$ when k is a scalar of row in M

5. $$\begin{vmatrix} 1 & 5 & -4 \\ -1 & -4 & 5 \\ -2 & -8 & 7 \end{vmatrix} \sim \begin{vmatrix} 1 & 5 & -4 \\ 0 & 1 & 1 \\ 0 & 0 & -3 \end{vmatrix} =$$

$$1 \cdot 1 \cdot -3 = -3$$

9. $$\begin{vmatrix} 1 & -1 & -3 & 0 \\ 0 & 1 & 5 & 4 \\ -1 & 0 & 5 & 3 \\ 3 & -3 & -2 & 3 \end{vmatrix} \sim \begin{vmatrix} 1 & -1 & -3 & 0 \\ 0 & 1 & 5 & 4 \\ 0 & 0 & 7 & 7 \\ 0 & 0 & 0 & -4 \end{vmatrix}$$

$$1 \cdot 1 \cdot 7 \cdot (-4) = -28$$

15. 27 3·7

18. −7 ~~stays the same~~

21. $\text{Det}A = 2\begin{vmatrix}3 & 2\\ 9 & 2\end{vmatrix} - 6\begin{vmatrix}1 & 2\\ 3 & 2\end{vmatrix}$

$2(6-18)-6(2-6)=0$

not invertible

24. $4\begin{vmatrix}0 & -5\\ 7 & -2\end{vmatrix} - 6\begin{vmatrix}-7 & -3\\ 7 & -2\end{vmatrix} + 2\begin{vmatrix}-7 & 3\\ 0 & -5\end{vmatrix}$

$4\cdot 35 - 6\cdot 35 + 2\cdot 35 = 0$

~~not~~ linearly ~~in~~dependent

31. $AA^{-1} = I$

$\det(AA^{-1}) = \det(I)$

$\det(A)\det(A^{-1}) = 1$

$\det(A^{-1}) = \dfrac{1}{\det(A)}$

40. a. $(-3)(-1) = 3$

b. $(-1)^5 = -1$

c. $\det(rA) = r^n \cdot \det(A$

$\det(2A = 2^4 \cdot (-3) =$

$16 \cdot -3 = -48$

d. $(-3)(-1)(-3) = -9$

e. $\det(B^{-1}) \det(B) \det(A$

$1 \cdot \det(A$

$1 \cdot -3 = -3$

41. $\det(B) + \det(E) = (a+e)d - (b+f)c$

$(ad - bc) + (ed - fc)$

$= ad + ed - bc + fc$

$= (a+e)d - (b+f)c$

S.T. 3.2

added to another row

a. ~~A~~ mutiple of (row of A) $\Rightarrow$ B
then $\det(B) = \det(A)$

~~*~~ swap rows then multiply det by -1

~~*~~

row of A (scalar K) then

K det A

B. ~~*~~ if $\det A = 0$

then A not invertible