Solution to Practice 4b

(1) $\begin{vmatrix} 5 & 2 & 4 \\ 1 & 3 & 1 \\ 3 & 2 & 2 \end{vmatrix} =$

$(5)(-1)^{1+1}\begin{vmatrix} 3 & 1 \\ 2 & 2 \end{vmatrix} + (2)(-1)^{1+2}\begin{vmatrix} 1 & 1 \\ 3 & 2 \end{vmatrix} + (4)(-1)^{1+3}\begin{vmatrix} 1 & 3 \\ 3 & 2 \end{vmatrix} =$

$5((3)(2) - (2)(1)) - 2((1)(2) - (3)(1)) + 4((1)(2) - (3)(3)) =$

$5(4) - 2(-1) + 4(-7) =$

-6

(2) $\begin{vmatrix} 1 & -1 & 1 \\ 2 & 3 & 2 \\ 2 & -2 & 1 \end{vmatrix} =$

$(1)(-1)^{1+1}\begin{vmatrix} 3 & 2 \\ -2 & 1 \end{vmatrix} + (-1)(-1)^{1+2}\begin{vmatrix} 2 & 2 \\ 2 & 1 \end{vmatrix} + (1)(-1)^{1+3}\begin{vmatrix} 2 & 3 \\ 2 & -2 \end{vmatrix} =$

$((3)(1) - (-2)(2)) + ((2)(1) - (2)(2)) + ((2)(-2) + (2)(3)) =$

$7 - 2 + -10 =$

-5

(3) $\begin{vmatrix} -7 & 3 & 8 \\ 6 & 6 & -2 \\ 5 & 4 & 9 \end{vmatrix} =$

$(-7)(-1)^{1+1}\begin{vmatrix} 6 & -2 \\ 4 & 9 \end{vmatrix} + (3)(-1)^{1+2}\begin{vmatrix} 6 & -2 \\ 5 & 9 \end{vmatrix} + (8)(-1)^{1+3}\begin{vmatrix} 6 & 6 \\ 5 & 4 \end{vmatrix} =$

$-7((6)(9) - (4)(-2)) - 3((6)(9) - (5)(-2)) + 8((6)(4) - (5)(6)) =$

$-7(62) - 3(64) + 8(-6) =$

-674

(4) $\begin{vmatrix} 0 & 4 & 0 \\ 7 & 0 & 0 \\ 0 & 0 & 3 \end{vmatrix} =$

$(0)(-1)^{1+1}\begin{vmatrix} 0 & 0 \\ 0 & 3 \end{vmatrix} + (4)(-1)^{1+2}\begin{vmatrix} 7 & 0 \\ 0 & 3 \end{vmatrix} + (0)(-1)^{1+3}\begin{vmatrix} 7 & 0 \\ 0 & 0 \end{vmatrix} =$

$0 - 4((7)(3) - (0)(0)) + 0 =$

$-4(21) = -84$