3.1.1 Determinant, second column.

$$\begin{vmatrix} 3 & 0 & 4 \\ 3 & 3 & 3 \\ 0 & 5 & -2 \end{vmatrix} = \underbrace{-0 \times (-6)}_{0} + \underbrace{3(-6)}_{-18} \underbrace{- 5(-3)}_{+15}$$

$$= \boxed{-3}$$

3.1.4 Det, first row

$$\begin{vmatrix} 2 & -4 & 3 \\ 2 & 1 & 3 \\ 1 & 4 & -2 \end{vmatrix} = \begin{array}{l} 2(-14) - (-4)(-7) + 3(7) \\ = -28 - 28 + 21 \\ = \boxed{-35} \end{array}$$

Det, second column

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

$$= -28 - 7 = \boxed{-35}$$

3.1.5 Det, first row

$$\begin{vmatrix} 3 & 7 & -3 \\ 5 & 0 & 6 \\ 4 & 5 & 3 \end{vmatrix} = \begin{array}{l} 3(-30) - 7(-9) + (-3)(25) \\ = -90 + 63 - 75 = -90 - 12 \\ = \boxed{-102} \end{array}$$

3.1.7

$$A = \begin{bmatrix} 7 & -5 & 2 \\ 5 & 1 & 3 \\ 0 & 4 & -2 \end{bmatrix}$$

$$\det A = 7 \begin{vmatrix} 1 & 3 \\ 4 & -2 \end{vmatrix} - 5 \begin{vmatrix} -5 & 2 \\ 4 & -2 \end{vmatrix}$$

$$+ 0 \begin{vmatrix} -5 & 2 \\ 1 & 3 \end{vmatrix}$$

$$= 7(-14) - 5(2) + 0$$

$$= -98 - 10 = \boxed{-108}$$

$\boxed{3.1.9}$

$$\begin{vmatrix} 5 & 0 & 0 & 5 \\ 4 & 8 & 3 & -2 \\ 2 & 0 & 0 & 0 \\ 9 & 2 & 1 & 4 \end{vmatrix} = (+2)\begin{vmatrix} 0 & 0 & 5 \\ 8 & 3 & -2 \\ 2 & 1 & 4 \end{vmatrix} = (+2)(+5)\begin{vmatrix} 8 & 3 \\ 2 & 1 \end{vmatrix}$$

$$= 10(2) = \boxed{20}$$

$\boxed{3.1.10}$

$$\begin{vmatrix} 1 & -2 & 7 & 4 \\ 0 & 0 & 2 & 0 \\ 5 & -4 & -5 & 3 \\ 4 & 0 & 4 & 2 \end{vmatrix} = (-2)\begin{vmatrix} 1 & -2 & 4 \\ 5 & -4 & 3 \\ 4 & 0 & 2 \end{vmatrix}$$

$$= (-2)\left[4(10) + 2(6)\right] =$$

$$\boxed{-104} \qquad = (-2)(40 + 12) = (-2)(52)$$

$\boxed{3.1.14}$

$$\begin{vmatrix} 2 & 3 & 3 & 4 & 0 \\ 4 & 0 & -4 & 1 & 0 \\ 6 & -3 & 7 & 4 & 1 \\ 4 & 0 & 0 & 0 & 0 \\ 6 & 3 & 4 & 2 & 0 \end{vmatrix} = -4 \begin{vmatrix} 3 & 3 & 4 & 0 \\ 0 & -4 & 1 & 0 \\ -3 & 7 & 4 & 1 \\ 3 & 4 & 2 & 0 \end{vmatrix}$$

$$= (-4)(-1)\begin{vmatrix} 3 & 3 & 4 \\ 0 & -4 & 1 \\ 3 & 4 & 2 \end{vmatrix} = 4\left[(-4)(-6) + (-1)(3)\right]$$

$$= 4(24 - 3) = 4 \times 21 = \boxed{84}$$

3.1.16

$$\begin{array}{|ccc|cc}
4 & -2 & -3 & 4 & -2 \\
0 & 5 & -3 & 0 & 5 \\
-4 & -5 & 0 & -4 & -5
\end{array}$$

$$= 0 - 24 + 0 - (60 + 60 + 0)$$

$$= -24 - 120 = \boxed{-144}$$

3.1.25

$$\begin{vmatrix}
1 & -x & 0 \\
0 & 1 & 0 \\
0 & 0 & 1
\end{vmatrix} = \boxed{1}$$

because the original matrix A is a triangular matrix $\Rightarrow \det = 1 \times 1 \times 1 = 1$

3.1.26

$$\begin{vmatrix}
0 & 1 & 0 \\
1 & 0 & 0 \\
0 & 0 & 1
\end{vmatrix} = +1 \begin{vmatrix} 0 & 1 \\ 1 & 0 \end{vmatrix} = (1)(-1) = \boxed{-1}$$