

1.5

$$\#8 \quad \begin{array}{c} \downarrow \\ \left| \begin{array}{cccc} 2 & -1 & 5 & 6 \\ 0 & 3 & 4 & 0 \\ 0 & 1 & 5 & 2 \\ 0 & 1 & -3 & 0 \end{array} \right| \end{array}$$

$$= 2 \cdot \begin{array}{c} \downarrow \\ \left| \begin{array}{ccc} 3 & 4 & 0 \\ 1 & 5 & 2 \\ 1 & -3 & 0 \end{array} \right| \end{array}$$

$$= 2(-2) \cdot \begin{array}{c} \downarrow \\ \left| \begin{array}{cc} 3 & 4 \\ 1 & -3 \end{array} \right| \end{array}$$

$$= 2(-2) (-9 - 4)$$

$$= 4 \cdot 13$$

$$= 52$$

#11.

$$\begin{vmatrix} 1 & -2 & 1 \\ 2 & 1 & 3 \\ -1 & 4 & 5 \end{vmatrix} \begin{array}{l} R_2 + (-2)R_1 \\ R_3 + (1)R_1 \end{array}$$

$$= \begin{vmatrix} 1 & -2 & 1 \\ 0 & 5 & 1 \\ 0 & 2 & 6 \end{vmatrix} R_2 + \left(-\frac{2}{5}\right)R_2$$

$$= \begin{vmatrix} 1 & -2 & 1 \\ 0 & 5 & 1 \\ 0 & 0 & \frac{28}{5} \end{vmatrix}$$

$$= 1 \cdot 5 \cdot \frac{28}{5}$$

$$= 28$$

1.6

#15.

$$A = \begin{bmatrix} 3 & -2 \\ 1 & 4 \end{bmatrix}, \quad B = \begin{bmatrix} 1 & 2 \\ -2 & 3 \end{bmatrix}$$

$$(a) \quad \det A = 12 + 2 = 14$$

$$\det B = 3 + 4 = 7$$

$$(b) \quad \det(AB) = \det A \cdot \det B$$

$$= 14 \cdot 7$$

$$= 98$$

$$\det(A^{-1}) = \frac{1}{\det A} = \frac{1}{14}$$

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

$$= \det(B) \cdot \frac{1}{\det(A)}$$

$$= \frac{7}{14}$$

$$= \frac{1}{2}$$