

$$1) \begin{vmatrix} 1 & 5 \\ -1 & 3 \end{vmatrix} = 1 \cdot 3 - 5(-1) = 3 - (-5) = 8$$

=

Vižovné pravidlo

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

$$= -12 + 3 - 2 + 2 = \underline{\underline{-9}}$$

Sarrusovo pravidlo

$$\left[\begin{array}{cccc|c} 2 & 1 & 3 & 2 & (-1) \\ 2 & 1 & 4 & 2 & 2 \\ 1 & 0 & 2 & 1 & 1 \end{array} \right] = \frac{1}{2} \left[\begin{array}{cccc|c} 2 & 1 & 3 & 2 & (-1) \\ 0 & 3 & 7 & 6 & 2 \\ 1 & 0 & 2 & 1 & 1 \end{array} \right] = \frac{1}{2} \left[\begin{array}{cccc|c} 2 & 1 & 3 & 2 & 2 \\ 0 & 3 & 7 & 6 & 2 \\ 0 & 0 & 1 & 0 & 1 \\ 1 & 0 & 2 & 1 & (-2) \end{array} \right]$$

$$= \frac{1}{2} \cdot \left(-\frac{1}{2}\right) \left[\begin{array}{cccc|c} 2 & 1 & 3 & 2 & 2 \\ 0 & 3 & 7 & 6 & 2 \\ 0 & 0 & 1 & 0 & 1 \\ 0 & 1 & -1 & 0 & -2 \end{array} \right] = +\frac{1}{4} \left[\begin{array}{cccc|c} 2 & 2 & 3 & 1 & 2 \\ 0 & 6 & 7 & 3 & 2 \\ 0 & 0 & 1 & 0 & 1 \\ 0 & 0 & -1 & 1 & -2 \end{array} \right] = \frac{1}{4} \left[\begin{array}{cccc|c} 2 & 2 & 3 & 1 & 2 \\ 0 & 6 & 7 & 3 & 2 \\ 0 & 0 & 1 & 0 & 1 \\ 0 & 0 & 0 & 1 & -1 \end{array} \right] = \frac{2 \cdot 6 \cdot 1 \cdot 1}{4}$$

$$= \underline{\underline{3}}$$

$$\begin{vmatrix} 2 & 1 & 3 & 2 \\ -1 & 1 & 2 & 2 \\ 2 & 1 & 4 & 2 \\ \textcircled{1} & \boxed{0} & \triangle 2 & \diamond 1 \end{vmatrix} = \textcircled{1} \cdot (-1)^{4+1} \begin{vmatrix} 1 & 3 & 2 \\ 1 & 2 & 2 \\ 1 & 4 & 2 \end{vmatrix} + \boxed{0} \cdot (-1)^{4+2} \begin{vmatrix} 2 & 3 & 2 \\ -1 & 2 & 2 \\ 2 & 4 & 2 \end{vmatrix} +$$

rozvoj podle 4. řádku

$$+ \triangle 2 \cdot (-1)^{4+3} \begin{vmatrix} 2 & 1 & 2 \\ -1 & 1 & 2 \\ 2 & 1 & 2 \end{vmatrix} + \diamond 1 \cdot (-1)^{4+4} \begin{vmatrix} 2 & 1 & 3 \\ -1 & 1 & 2 \\ 2 & 1 & 4 \end{vmatrix}$$

"0

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

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

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

$$= \underbrace{-1 \cdot (-1)}_1 \begin{vmatrix} -1 & 3 & 2 & 1 \\ 5 & 1 & 0 & 2 \\ 2 & 5 & -1 & 2 \\ 3 & 3 & -2 & 1 \end{vmatrix} = \begin{vmatrix} -1 & 3 & 2 & 1 \\ 5 & 1 & 0 & 2 \\ 2 & 5 & -1 & 2 \\ 2 & 6 & 0 & 2 \end{vmatrix} = \begin{vmatrix} 3 & 13 & 0 & 5 \\ 5 & 1 & 0 & 2 \\ 2 & 5 & -1 & 2 \\ 2 & 6 & 0 & 2 \end{vmatrix} =$$

$$= -1 \cdot (-1) \begin{vmatrix} 3 & 13 & 5 \\ 5 & 1 & 2 \\ 2 & 6 & 2 \\ 3 & 13 & 5 \\ 5 & 1 & 2 \end{vmatrix} = (-1) \cdot (6 + 150 + 52 - 10 - 36 - 130) = - (68 - 36) = -32$$

Vyřešte rovnici:

$$\begin{vmatrix} 2x & 3 \\ 6 & x \end{vmatrix} = 0$$

$$2x^2 - 18 = 0 \quad |:2$$

$$x^2 - 9 = 0$$

$$x^2 = 9$$

$$x_1 = 3, x_2 = -3$$

$$\begin{vmatrix} x & 1 & 1 \\ x & 0 & x \\ 2 & 1 & x \\ x & 1 & 1 \\ x & 0 & x \end{vmatrix} = 0$$

$$x + 2x - x^2 - x^2 = 0$$

$$3x - 2x^2 = 0$$

$$x(3 - 2x) = 0$$

$$\underbrace{x=0}$$

$$3 - 2x = 0$$

$$3 = 2x$$

$$\underline{\underline{\frac{3}{2} = x}}$$

$$\begin{vmatrix} 3 & 1 & 1 \\ x & 1 & x \\ 2 & 1 & x \\ 3 & 1 & 1 \\ x & 1 & x \end{vmatrix} > 0$$

$$\cancel{3x} + x + 2x - 2 - \cancel{3x} - x^2 > 0$$

$$-x^2 + 3x - 2 > 0 \quad / \cdot (-1)$$

$$x^2 - 3x + 2 < 0$$

$$(x-2)(x-1) < 0$$

