1.2.59

$\begin{vmatrix} 2 & -3 \\ 5 & -4 \end{vmatrix} = 2 \cdot -4 - 5 \cdot -3 = 7$

1.2.60

$\begin{vmatrix} a & b \\ 0 & 0 \end{vmatrix} = a \cdot 0 - 0 \cdot b = 0$

1.2.61

$\begin{vmatrix} x^2 & x \\ y^2 & y^2 \end{vmatrix} = x^2y^2 - x^2y^2 = 0$

1.2.62

$\begin{vmatrix} a & 3a \\ b & 3b \end{vmatrix} = a \cdot 3b - b \cdot 3a = 3ab - 3ab = 0$

1.2.63

$\begin{vmatrix} \cos\alpha & \sin\alpha \\ \sin\alpha & \cos\alpha \end{vmatrix} = \cos\alpha \cdot \cos\alpha - \sin\alpha \cdot \sin\alpha =$

$= \cos 2\alpha$

1.2.64

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

$= x^3 - x^3 - 1^3 = -1$

1.2.65

$\begin{pmatrix} 2x-3 & 4 \\ -x & -3 \end{pmatrix} = 0 = (2x-3)\cdot(-3) - (-x)\cdot 4 =$

$= -6x + 9 + 4x = 0 = -2x + 9 = 0$

$x = 4{,}5$

1.2.66

$\begin{pmatrix} x+3 & x+1 \\ x-1 & x-2 \end{pmatrix} = (x+3)(x-2) - (x+1)(x-1) =$

$= x^2 - 2x + 3x - 6 - (x^2 - 1) =$

$= -2x + 3x - 6 + 1 = x - 5 = 0$

$x = 5$

1.2.67

$\begin{pmatrix} 3-x & x+2 \\ x+1 & x-1 \end{pmatrix} = 6 = 3x - 3 - x^2 + x -$

$-(x^2 + 2x + x + 2) = 3x - 3 - x^2 + 2x -$

$-(x^2 + 3x + 2) = -3 - x^2 + x - x^2 - 2$

$= -5 - x^2 + x - x^2 = -5 - 2x^2 + x -$

1.2.65

$\begin{pmatrix} 2x-3 & 4 \\ -x & -3 \end{pmatrix} = 0 = (2x-3)\cdot(-3) - (-x)\cdot 4 =$

$= -6x + 9 + 4x = 0 = -2x + 9 = 0$

$x = 4{,}5$

1.2.66

$\begin{pmatrix} x+3 & x+1 \\ x-1 & x-2 \end{pmatrix} = (x+3)(x-2) - (x+1)(x-1) =$

$= x^2 - 2x + 3x - 6 - (x^2 - 1) =$

$= -2x + 3x - 6 + 1 = x - 5 = 0$

$x = 5$

1.2.67

$\begin{pmatrix} 3-x & x+2 \\ x+1 & x-1 \end{pmatrix} = 6 = 3x - 3 - x^2 + x -$

$-(x^2 + 2x + x + 2) = 3x - 3 - x^2 + 2x -$

$-(x^2 + 3x + 2) = -3 - x^2 + x - x^2 - 2$

$= -5 - x^2 + x - x^2 = -5 - 2x^2 + x -$

$= 1$

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

$$= 1 \cdot 7 + -1 \cdot 6 + 1 \cdot 4 = 1$$

$1\ 2\ 3\ 3$

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

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

$$\cdot 3 \cdot 10 + 1 \cdot 5 \cdot 13 = -87$$

$1\ 2\ 7\ 4$

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

$$(-1)^4 \cdot \begin{vmatrix} b & c \\ c & a \end{vmatrix} = 1 \cdot cb - a + -1 \cdot 2b - ca +$$

$$+ 1 \cdot ba - 2c = cb - 2a - 2b - ca + ba$$

$$\begin{vmatrix} a & 0 & 0 \\ b & b & 0 \\ c & c & c \end{vmatrix} = a \cdot b \cdot c - a \cdot 0 \cdot 0 =$$

$$- 0 \cdot 0 \cdot c + 0 \cdot 0 \cdot 0 + 0 \cdot 0 \cdot 0 - 0 \cdot 0 \cdot b =$$

$$= 0$$

$$\begin{vmatrix} 0 & 1 & 1 \\ 1 & 0 & 1 \\ 1 & 1 & 0 \end{vmatrix} = 0 \cdot 0 \cdot 0 - 0 \cdot 1 \cdot 1 - 1 \cdot 1 \cdot 0 +$$

$$+ 1 \cdot 1 \cdot 1 + 1 \cdot 1 \cdot 1 - 1 \cdot 1 \cdot 0 = 2$$

$$\begin{vmatrix} \cos\alpha & \cos\beta & 0 \\ \cos\alpha & 0 & \cos\gamma \\ 0 & \cos\beta & \cos\gamma \end{vmatrix} = \cos\alpha \cdot 0 \cdot \cos\gamma -$$

$$- \cos\alpha \cdot \cos\gamma \cdot \cos\beta - \cos\alpha \cdot \cos\beta \cdot \cos$$

$$+ \cos\alpha \cdot \cos 0 \cdot \cos\beta + 0 \cdot \cos\beta \cdot$$

$$\cdot \cos\gamma - 0 \cdot 0 \cdot 0 =$$

$$\begin{vmatrix} 1 & 2 & 7 & 8 \\ 6 & 1 & 0 & \\ & & & \\ 0 & 2 & 0 & \end{vmatrix} = 0 \cdot 1 \cdot 0 - 0 \cdot x \cdot x - x \cdot x \cdot$$
$$+ x \cdot 0 \cdot 2 + 0 \cdot x \cdot x - 0 \cdot 0 \cdot 1 =$$
$$= 0$$

1.2.79.

$$\begin{vmatrix} 2 & 3 & 5 \\ 0 & -1 & 0 \\ 6 & 7 & 8 \end{vmatrix} = (-1)^2 \cdot \begin{vmatrix} 0 & 0 \\ 6 & 8 \end{vmatrix} \cdot (-1)^3 \cdot \begin{vmatrix} 2 & 5 \\ 6 & 8 \end{vmatrix}$$
$$\cdot (-1)^4 \cdot \begin{vmatrix} 2 & 5 \\ 0 & 0 \end{vmatrix} = 1 \cdot 0 \cdot (-1) \cdot 14 - 14 - 1 \cdot 0 =$$
$$= 14$$

1.2.80

$$\begin{vmatrix} 1 & 2 & 0 \\ 3 & 4 & 0 \\ 5 & 6 & 7 \end{vmatrix} = (-1)^2 \cdot \begin{vmatrix} 2 & 0 \\ 4 & 0 \end{vmatrix} + (-1)^3 \cdot \begin{vmatrix} 1 & 0 \\ 3 & 0 \end{vmatrix} =$$
$$= (-1)^4 \cdot \begin{vmatrix} 1 & 2 \\ 3 & 4 \end{vmatrix} = 1 \cdot 0 - -1 \cdot 0 -$$
$$-1 \cdot -2 = 2$$