In [2]:

```
import numpy as np
```

1. Решить систему уравнений методом Крамера:

а) $\begin{cases} x_1 - 2x_2 = 1 \\ 3x_1 - 4x_2 = 7 \end{cases}$ $\begin{cases} x_1 - 2x_2 = 1 \\ 3x_1 - 4x_2 = 7 \end{cases}$

б) $\begin{cases} 2x_1 - x_2 + 5x_3 = 10 \\ x_1 + x_2 - 3x_3 = -2 \\ 2x_1 + 4x_2 + x_3 = 1 \end{cases}$ $\begin{cases} 2x_1 - x_2 + 5x_3 = 10 \\ x_1 + x_2 - 3x_3 = -2 \\ 2x_1 + 4x_2 + x_3 = 1 \end{cases}$

а)

$$\left(\begin{array}{cc|c} 1 & -2 & 1 \\ 3 & -4 & 7 \end{array}\right) \cdot \left(\begin{array}{cc|c} 1 & -2 & 1 \\ 3 & -4 & 7 \end{array}\right).$$

In [3]:

```
A = np.array([[1, -2],[3, -4]])
detA = np.linalg.det(A)
detA
```

Out[3]:

```
2.0000000000000004
```

In [4]:

```
A1 = np.array([[1, -2],[7, -4]])
detA1 = np.linalg.det(A1)
detA1
```

Out[4]:

```
9.999999999999998
```

In [5]:

```
A2 = np.array([[1, 1],[3, 7]])
detA2 = np.linalg.det(A2)
detA2
```

Out[5]:

```
4.0
```

In [6]:

```
X1 = detA1/detA
X2 = detA2/detA
X1, X2
```

Out[6]:

```
(4.999999999999998, 1.9999999999999996)
```

b)

$$\left(\begin{array}{ccc|c} 2 & -1 & 5 & 10 \\ 1 & 1 & -3 & -2 \\ 2 & 4 & 1 & 1 \end{array}\right) . \left(\begin{array}{ccc|c} 2 & -1 & 5 & 10 \\ 1 & 1 & -3 & -2 \\ 2 & 4 & 1 & 1 \end{array}\right) .$$

In [7]:

```
AB = np.array([[2, -1, 5],[1, 1, -3], [2, 4, 1]])
detAB = np.linalg.det(AB)
detAB
```

Out[7]:

```
42.99999999999998
```

In [8]:

```
AB1 = np.array([[10, -1, 5],[-2, 1, -3], [1, 4, 1]])
detAB1 = np.linalg.det(AB1)
detAB1
```

Out[8]:

```
86.00000000000004
```

In [9]:

```
AB2 = np.array([[2, 10, 5],[1, -2, -3], [2, 1, 1]])
detAB2 = np.linalg.det(AB2)
detAB2
```

Out[9]:

```
-43.000000000000014
```

In [10]:

```
AB3 = np.array([[2, -1, 10],[1, 1, -2], [2, 4, 1]])
detAB3 = np.linalg.det(AB3)
detAB3
```

Out[10]:

```
42.99999999999998
```

In [11]:

```
X1 = detAB1/detAB
X2 = detAB2/detAB
X3 = detAB3/detAB
X1, X2, X3
```

Out[11]:

```
(2.0000000000000018, -1.0000000000000009, 1.0)
```

In [ ]:

```

```