1) $\begin{cases} 3x - 2y + 5z = 7 \\ 7x + 4y - 8z = 3 \\ 5x - 3y - 4z = -12 \end{cases}$ — система линейных уравнений

1) Метод Крамера (правило треугольников)

$$\Delta = \begin{vmatrix} 3 & -2 & 5 \\ 7 & 4 & -8 \\ 5 & -3 & -4 \end{vmatrix} = \underset{-43}{3 \cdot 4 \cdot (-4)} + \underset{80}{(-2) \cdot (-8) \cdot 5} + \underset{-105}{5 \cdot (-3) \cdot 7} - \underset{-100}{5 \cdot 4 \cdot 5} - \underset{-56}{(-2) \cdot 7 \cdot (-4)} - \underset{-72}{3 \cdot (-8) \cdot (-3)} = -301$$

$$\Delta_1 = \begin{vmatrix} 7 & -2 & 5 \\ 3 & 4 & -8 \\ -12 & -3 & -4 \end{vmatrix} = \underset{-112}{7 \cdot 4 \cdot (-4)} + \underset{-192}{(-2)(-8) \cdot (-12)} + \underset{-45}{5 \cdot 3 \cdot (-3)} - \underset{+240}{5 \cdot 4 \cdot (-12)} - \underset{-24}{(-2) \cdot 3 \cdot (-4)} - \underset{-168}{7 \cdot (-8)(-3)} = -301$$

$$\Delta_2 = \begin{vmatrix} 3 & 7 & 5 \\ 7 & 3 & -8 \\ 5 & -12 & -4 \end{vmatrix} = \underset{-36}{3 \cdot 3 \cdot (-4)} + \underset{-280}{7 \cdot (-8) \cdot 5} + \underset{-420}{5 \cdot (-12) \cdot 7} - \underset{-75}{5 \cdot 3 \cdot 5} - \underset{+196}{7 \cdot 7 \cdot (-4)} - \underset{-288}{3 \cdot (-8) \cdot (-12)} = -903$$

$$\Delta_3 = \begin{vmatrix} 3 & -2 & 7 \\ 7 & 4 & 3 \\ 5 & -3 & -12 \end{vmatrix} = \underset{-144}{3 \cdot 4 \cdot (-12)} + \underset{-30}{(-2) \cdot 3 \cdot 5} + \underset{-147}{7 \cdot (-3) \cdot 7} - \underset{-140}{7 \cdot 4 \cdot 5} - \underset{-168}{(-2) \cdot 7 \cdot (-12)} - \underset{+27}{3 \cdot 3 \cdot (-3)} = -602$$

$$x = \Delta_1 / \Delta = \frac{-301}{-301} = 1 \; ; \; y = \frac{\Delta_2}{\Delta} = \frac{-903}{-301} = 3 \; ; \; z = \frac{\Delta_3}{\Delta} = \frac{-602}{-301} = 2$$

$$\begin{cases} 3 \cdot 1 - 2 \cdot 3 + 5 \cdot 2 = 7 \\ 7 \cdot 1 + 4 \cdot 3 - 8 \cdot 2 = 3 \\ 5 \cdot 1 - 3 \cdot 3 - 4 \cdot 2 = -12 \end{cases}$$

Ответ: $x = 1$; $y = 3$; $z = 2$

2) $\begin{cases} x^2 + yx - 9 = 0 \\ x - y/5 = 0 \end{cases}$ — нелинейное уравнение

— линейное уравнение

Система — нелинейная.

$x = \frac{y}{5}$

$\frac{y^2}{25} + \frac{y^2}{5} - 9 = 0$

$x = \pm\frac{1}{5}\sqrt{\frac{225}{6}}$

$y^2 + 5y^2 - 225 = 0$

$6y^2 = 225$

$y = \pm\sqrt{\frac{225}{6}}$

Ответ: $x = \pm\frac{1}{5}\sqrt{\frac{225}{6}}$; $y = \pm\sqrt{\frac{225}{6}}$

3) $\begin{cases} x \cdot y = 48 \\ 2x + 2y = 28 \end{cases}$ $\begin{cases} x \cdot y = 48 \\ x + y = 14 \end{cases}$

$y = 14 - x$

$x \cdot (14 - x) = 48$

$y_1 = 14 - 6 = 8$

$-x^2 + 14x - 48 = 0$

$y_2 = 14 - 8 = 6$

$D = b^2 - 4ac = 14^2 - 4(-1)\cdot(-48) = 196 - 192 = 4$

$x_{1,2} = \frac{-b \pm \sqrt{D}}{2a}$

$x_1 = \frac{-14 + 2}{-2} = 6$ $x_2 = \frac{-14 - 2}{-2} = 8$

Ответ: длина $a = 6(8)$, ширина $b = 8(6)$

4.

```
import numpy as np
import matplotlib.pyplot as plt

x = np.linspace(0, 10, 121)

plt.plot(x, np.cos(x))
plt.plot(x, np.cos(5 * x))
plt.show()
```