

$$\frac{x}{x^2-2} + \frac{6 \cdot (x^2-2)}{x} = 7$$

Положим $\frac{x^2-2}{x} = t$

$$t^{-1} + 6t = 7$$

$$\frac{1}{t} + 6t = 7$$

$$\frac{1+6t^2}{t} = 7 \quad t \neq 0$$

$$1+6t^2 = 7t$$

$$6t^2 - 7t + 1 = 0 \quad D = 49 - 4 \cdot 6 \cdot 1 = 49 - 24 = 25$$

$$\sqrt{D} = 5$$

$$t_1 = \frac{7+5}{2 \cdot 6} = \frac{12}{12} = 1 \quad t_2 = \frac{7-5}{12} = \frac{2}{12} = \frac{1}{6}$$

$$\frac{x^2-2}{x} = 1 \quad x \neq 0$$

$$x^2 - 2 = x$$

$$x^2 - x - 2 = 0 \quad D = 1 - 4 \cdot 1 \cdot (-2) = 9 \quad \sqrt{D} = 3$$

$$x_1 = \frac{1+3}{2} = \frac{4}{2} = 2 \quad x_2 = \frac{1-3}{2} = \frac{-2}{2} = -1$$

$$\frac{x^2-2}{x} = \frac{1}{6} \quad x \neq 0$$

$$6(x^2-2) = x$$

$$6x^2 - x - 12 = 0 \quad D = 1 - 4 \cdot 6 \cdot (-12) = 289 \quad \sqrt{D} = 17$$

$$x_3 = \frac{1+17}{12} = \frac{18}{12} = \frac{3}{2} = 1,5 \quad x_4 = \frac{1-17}{12} = \frac{-16}{12} = \frac{-4}{3} = -0,75$$

Ответ: $x_1 = 2; x_2 = -1; x_3 = 1,5; x_4 = -0,75$

$$\frac{3}{x^2-2x-2} - (x^2-2x) = 0$$

$$x^2-2x=y, \text{ тогда получаем}$$

$$\frac{3}{y-2} - y = 0$$

$$\frac{3 - y \cdot (y-2)}{y-2} = 0$$

$$\frac{3 - y^2 + 2y}{y-2} = 0$$

$$y-2 \neq 0 \quad y \neq 2$$

$$3 - y^2 + 2y = 0$$

$$-y^2 + 2y + 3 = 0$$

$$D = 4 - 4 \cdot (-1) \cdot 3 = 16$$

$$\sqrt{D} = \sqrt{16} = 4$$

$$y_1 = \frac{-2+4}{2 \cdot (-1)} = \frac{2}{-2} = -1$$

$$y_2 = \frac{-2-4}{2 \cdot (-1)} = \frac{-6}{-2} = 3$$

$$x^2 - 2x = -1$$

$$x^2 - 2x + 1 = 0$$

$$D = 4 - 4 \cdot 1 = 0$$

$$x_1 = x_2 = \frac{2}{2} = 1$$

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

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

$$D = 4 - 4 \cdot 1 \cdot (-3) = 16$$

$$\sqrt{D} = \sqrt{16} = 4$$

$$x_3 = \frac{2+4}{2} = 3$$

$$x_4 = \frac{2-4}{2} = \frac{-2}{2} = -1$$

$$\text{Ответ: } x_1 = 1; x_2 = 1; x_3 = 3; x_4 = -1$$