

$$(3) \log_2 (x^2 + 2x - 4) = 2 \quad (\Leftrightarrow)$$

$$\begin{cases} x^2 + 2x - 4 = 4 \\ x^2 + 2x - 4 > 0 \end{cases} \Leftrightarrow \begin{cases} x^2 + 2x - 8 = 0 \\ x^2 + 2x - 4 > 0 \end{cases} \Leftrightarrow$$

$$\Leftrightarrow \begin{cases} x = 2 \\ x = -4 \\ x > \sqrt{5} - 1 \\ x < -\sqrt{5} - 1 \end{cases} \Rightarrow \begin{cases} x = 2 \\ x = 4 \end{cases}$$

(4)

$$\begin{aligned} & x^2 + 2x - 4 \\ & D = 4 + 16 = 20 \\ & x_1 = \frac{-2 + 2\sqrt{5}}{2} \\ & x_2 = \frac{-2 - 2\sqrt{5}}{2} \end{aligned}$$

$$(1) \log_{1/2} (3x - 1) = \log_{1/2} (6x + 8) \quad (\Leftrightarrow)$$

$$\begin{cases} 3x - 1 = 6x + 8 \\ 3x - 1 > 0 \end{cases} \Leftrightarrow \begin{cases} 3x = -9 \\ x > 1/3 \end{cases} \Leftrightarrow$$

$$\Leftrightarrow \begin{cases} x = -3 \\ x > 1/3 \end{cases} \Rightarrow \text{решений нет}$$

$$(2) \log_7 (x^2 + 3x) = 2$$

$$\log_7 (x^2 + 3x) = \log_7 49$$

$$\begin{cases} x^2 + 3x = 49 \\ x^2 + 3x > 0 \end{cases} \Leftrightarrow \begin{cases} x^2 + 3x - 49 = 0 \\ x(x + 3) > 0 \end{cases} \Leftrightarrow$$

$$\Leftrightarrow \begin{cases} x_{1,2} = \frac{3 \pm \sqrt{205}}{2} \\ x > 0 \\ x < -3 \end{cases} \Rightarrow \underline{x_{1,2} = \frac{3 \pm \sqrt{205}}{2}}$$

$$x^2 + 3x - 49 = 0$$

$$D = 9 + 4 \cdot 49 = 205$$

$$x_{1,2} = \frac{3 \pm \sqrt{205}}{2}$$