▶ 10. $\log_{x+5}(x+7)^7 - \log_{x+5}(x^2 + 12x + 35) = 11$

$x^2 + 12x + 35 = (x+5)(x+7)$

$x_1 + x_2 = -12 \quad | \quad x_1 = -5$

$x_1 \cdot x_2 = 35 \quad | \quad x_2 = -7$

ОДЗ:
$$\begin{cases} x+5 > 0 \\ x+5 \neq 1 \\ x+7 > 0 \\ (x+5)(x+7) > 0 \end{cases} \qquad \begin{cases} x > -5 \\ x \neq -4 \\ x > -7 \\ x < -7, \ x > -5 \end{cases}$$

$$\boxed{\begin{array}{l} x > -5 \\ x \neq -4 \end{array}}$$
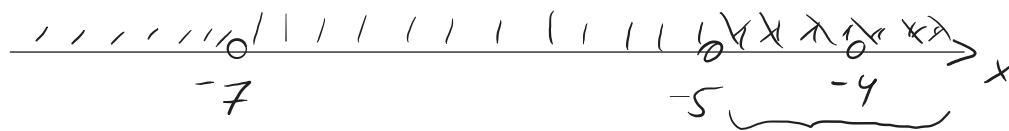
$\log_{x+5}(x+7)^7 - \log_{x+5}(x+5)(x+7) = 11$

$\log_{x+5}(x+7)^7 - \underbrace{\log_{x+5}(x+5)}_{1} - \log_{x+5}(x+7) = 11$

$\log_{x+5}\dfrac{(x+7)^7}{x+7} = 12$

$\log_{x+5}(x+7)^6 = 12$

$6\log_{x+5}(x+7) = 12 \quad |:6$

$\log_{x+5}(x+7) = 2$

$(x+5)^2 = x+7$

$x^2 + 10x + 25 - x - 7 = 0$

$x^2 + 9x + 18 = 0$

$x_1 + x_2 = -9$

$x_1 \cdot x_2 = 18$

$x_1 = -3, \ x_2 = -6$

$x_2 = -6$ не удовлетв. ОДЗ

Ответ: -3