

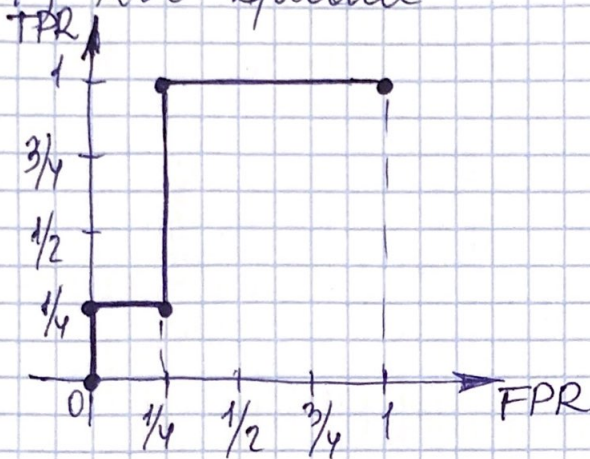
Задача №2.

$$N = 10000$$

$$\begin{array}{cc} \overbrace{- - - -}^{3N/8 = 3750} & \overbrace{+ + + +}^{3N/8 = 3750} \\ \overbrace{- - - -}^{N/8 = 1250} & \overbrace{+ + + +}^{N/8 = 1250} \end{array}$$

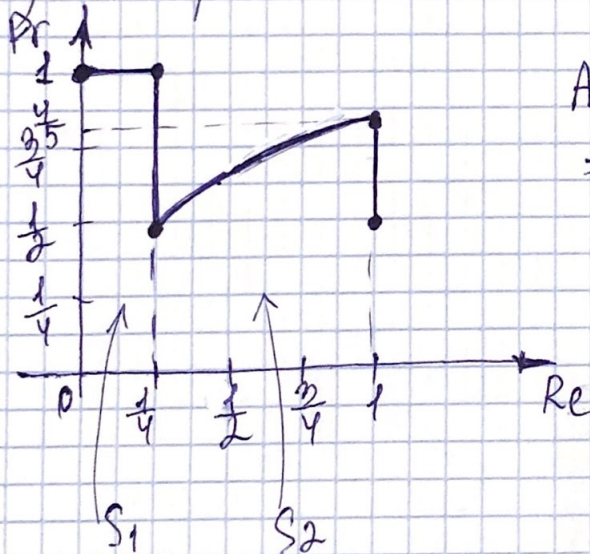
$$N_+ = N_- = 5000$$

1.) ROC-кривая



$$\begin{aligned} \text{AUC-ROC} &= \frac{1}{4} \cdot \frac{1}{4} + \frac{3}{4} \cdot 1 = \\ &= \frac{1}{16} + \frac{3}{4} = \frac{13}{16}. \end{aligned}$$

2.) PR-кривая



$$\begin{aligned} \text{AUC-PR} &= S_1 + S_2 = \\ &= \frac{1}{4} \cdot 1 + \int_{\frac{1}{4}}^1 \frac{x}{x + \frac{1}{4}} dx = \\ &= \frac{1}{4} + \left(x - \frac{1}{4} \ln(x + \frac{1}{4}) \right) \Big|_{\frac{1}{4}}^1 \approx \\ &\approx 0,25 + 0,52 = 0,77. \end{aligned}$$