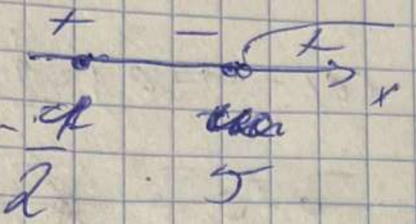
$\ldots + x^2 - 5x - 7 \le 0$

$2x^2 - 9x - 5 \le 0$

$x = \frac{10}{2} = 5$

$x = -\frac{1}{2}$

$x \ge 5$



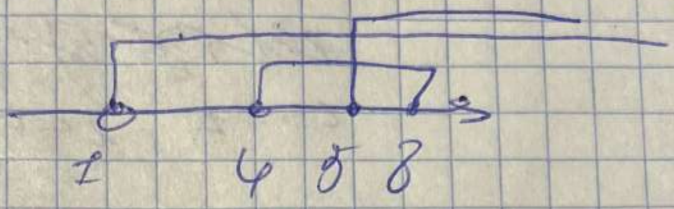
$x \ge 5$

$x > 1$

$x \ge 5$

$x \le 4$

$4 \le x \le 8$



$x \in [5; 8]$

(1)

$45^x - 27^x - 18 \cdot 15^x + 2 \cdot 9^{x+1} + 81 \cdot 5^x - 3^{x+4} \le 0$

$5^x \cdot 3^{2x} - 3^{3x} - 18 \cdot 5^x \cdot 3^x + 18 \cdot 3^{2x} + 81 \cdot 5^x - 81 \cdot 3^x \le 0$

$3^x = a;\ 5^x = b$

$ba^2 - a^3 - 18ab + 18a^2 + 81b - 81a \le 0$

$a^2(b-a) - 18a(b-a) + 81(b-a) \le 0$

$(b-a)(a^2 - 18a + 81) \le 0$

$(b-a)(a-9)^2 \le 0$

$(5^x - 3^x)(3^x - 9)^2 \le 0$

$5^x = 3^x \quad | : 3^x$

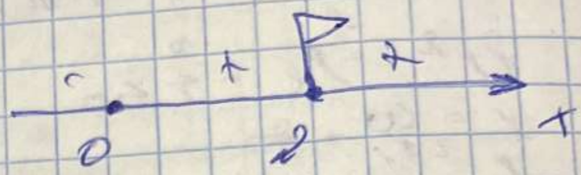
$\left(\frac{5}{3}\right)^x = 1$

$x = 0.$

$(3^x - 9)^2 = 0$

$3^x = 9$

$x = 2.$



$x \in (-\infty; 0] \cup \{2\}$

② $\frac{\log_2 x - 5}{1 - 2\log_2 x} \geq 2\log_2 x$

$x > 0$

$\log_2 x = t$

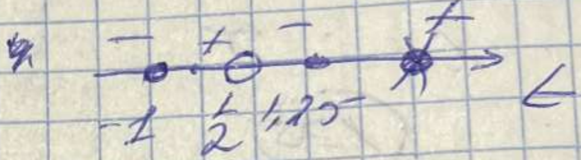
$\frac{t-5}{1-2t} \geq 2t$

$\frac{t-5}{1-2t} - 2t \geq 0$

$\frac{t-5-2t+4t^2}{1-2t} \geq 0$

$\frac{4t^2 - t - 5}{1-2t} \geq 0$

$\frac{(t+1)\left(t-\frac{5}{4}\right)}{2t-1} \leq 0$



~~$t \in (-\infty; -1] \cup (\frac{1}{2}; 1{,}25]$~~

$t \leq -1 \qquad \frac{1}{2} < t \leq 1{,}25$

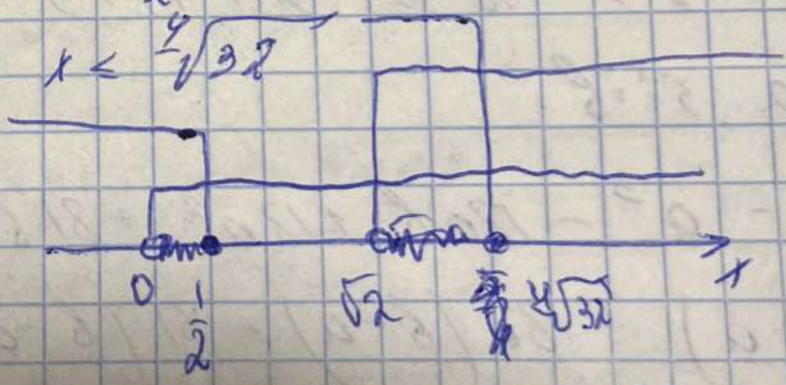
$\log_2 x \leq -1 \qquad \log_2 x > \frac{1}{2}$

$x \leq \frac{1}{2} \qquad x > \sqrt{2}$

$\log_2 x \leq 1{,}25$

$x \leq 2^{\frac{5}{4}}$

$x \leq \sqrt[4]{32}$



$x \in \left(0; \frac{1}{2}\right] \cup \left(\sqrt{2}; \sqrt[4]{32}\right]$

③ $x^2 \log_{16} x \geq \log_{16} x^5 + x \log_2 x$

$\frac{x^2}{4} \log_2 x \geq \frac{5}{4} \log_2 x + x \log_2 x$

$\frac{x^2}{4} \log_2 x \geq \log_2 x \left(\frac{5}{4} + x\right)$

$\frac{x^2}{4} \log_2 x - \log_2 x \left(\frac{5}{4} + x\right) \geq 0$

$(\log_2 x)\left(\frac{x^2}{4} - x - \frac{5}{4}\right) \geq 0$

$x > 0$ $\quad \frac{x^2}{4} - x - \frac{5}{4} \geq 0 \mid \cdot 4$

$x^2 - 4x - 5 \geq 0$

$(x-1)(x-5)$

$-\quad +\quad +$

$0 \quad 1 \quad 5 \quad x$

$x \geq 1$

$2^{\log_2^2 8}$

④ $2^{\log_2^2 x} + x^{\log_2 x} \leq 256$

$2^{(\log_2 x)(\log_2 x)} + x^{\log_2 x} \leq 256$

$x^{\log_2 x} + x^{\log_2 x} \leq 256$

$x^{\log_2 x}$

$2t \leq 256$

$t \leq 128$

$x^{\log_2 x} \leq 128$

$\log_2 x^{\log_2 x} \leq 7$

$\log_2^2 x \leq 7$

$\log_2^2 x - 7 \leq 0$

$(\log_2 x - \sqrt{7})(\log_2 x + \sqrt{7}) \leq 0$

$(x - 2^{\sqrt{7}})(x - 2^{-\sqrt{7}}) \leq 0$

$+ \quad - \quad +$

$2^{-\sqrt{7}} \quad 2^{\sqrt{7}} \quad x$

$x \in [2^{-\sqrt{7}}, 2^{\sqrt{7}}]$

$1 \cdot \left(\frac{1}{4} - 2 + \frac{5}{4}\right)^{-1} 0{,}25 \quad -1 \cdot \quad \frac{1}{4} \cdot \frac{1}{4} - \frac{1}{2}^{18} + \frac{5}{4}^{4} = \frac{1}{16} - \frac{8}{16} + \frac{20}{16} = \frac{13}{16}$

(5) $\log_5^2(25-x^2)-3\log_5(25-x^2)+2\geq 0$

$25-x^2\geq 0$

$(5-x)(5+x)>0$

$(x-5)(x+5)<0$

$x\in(-5;5)$

$\log_5(25-x^2)=t$

$t^2-3t+2\geq 0$

$(t-1)(t-2)\geq 0$

$t\leq 1$ $\qquad$ $t\geq 2$

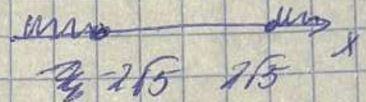
$\log_5(25-x^2)\leq 1$

$25-x^2\leq 5$

$20-x^2\leq 0$

$(2\sqrt5-x)(x+2\sqrt5)\leq 0$

$(x-2\sqrt5)(x+2\sqrt5)\geq 0$



$x\in(-5;-2\sqrt5]\cup[2\sqrt5;5)$

откуда нуль?

(6) $\log_{\frac{\sqrt2+\sqrt{13}}{5}}4\geq\log_{\frac{\sqrt2+\sqrt{13}}{5}}(5-2^x)$ $\qquad$ $4\geq 5-2^x$

$2^x\geq 1$

$x\geq 0$

$5-2^x>0$ $\qquad$ $\frac{\sqrt2+\sqrt{13}}{5} * 1 \mid\cdot 5$

$2^x<5$

$x<\log_2 5$

$\sqrt2+\sqrt{13} * 5 \mid ^2$ $\qquad$ $x\in[0;\log_2 5)$

$2+2\sqrt{26}+13 * 25$

$15+2\sqrt{26} * 25$

$\frac{\sqrt2+\sqrt{13}}{5}>1$

(7) $\lg^4 x - 4\lg^3 x + 5\lg^2 x - 2\lg x \geq 0$

$x > 0$, $\lg x = t$

$t^4 - 4t^3 + 5t^2 - 2t \geq 0$

$1 \quad -4 \quad 5 \quad -2 \quad 0$

$t(t^3 - 4t^2 + 5t - 2) \geq 0$

	1	-4	5	-2
1	1	-3	2	0

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

$(t-1)(t-2) = 0$

$t(t-1)^2(t-2) \geq 0$

$+ \quad 0 \quad - \quad 1 \quad - \quad 2 \quad + \quad t$

$t \leq 0$ $\qquad$ $t \geq 2$ $\qquad$ $t = 1$

$\lg x \leq 0$ $\qquad$ $\lg x \geq 2$ $\qquad$ $\lg x = 1$

$x \geq 100$ $\qquad$ $x = 10$

$\log_{10} x \leq 0$

$x \leq 1$

$x \in (-\infty; 1] \cup \{10\} \cup [100; +\infty)$