Одредити област дефинисаности ф-ја

1) $f(x) = \sqrt[3]{\dfrac{2x}{3-4\ln x}}$

$3-4\ln x \neq 0 \;\wedge\; x>0$

$\ln x \neq \frac{3}{4} \Rightarrow x \neq e^{3/4}$

$D_f: x \in (0, e^{3/4}) \cup (e^{3/4}, +\infty)$

2) $f(x) = \sqrt{\dfrac{3-2\ln x}{1+2\ln x}}$

$\dfrac{3-2\ln x}{1+2\ln x} \geq 0 \;\wedge\; 1+2\ln x \neq 0 \;\wedge\; x>0$

$3-2\ln x = 0 \Rightarrow x = e^{3/2}$

$1+2\ln x \neq 0 \Rightarrow x \neq e^{-1/2}$

	0 – $e^{-1/2}$	$e^{-1/2}$ – $e^{3/2}$	$e^{3/2}$ –
$3-2\ln x$	+ +	+ + + + +	− −
$1+2\ln x$	−	+ + +	+ +
$\dfrac{3-2\ln x}{1+2\ln x}$	−	+	−

$D_f: x \in (e^{-1/2}, e^{3/2}]$

3) $f(x) = \sqrt{\dfrac{x^2-x}{2x-x^2-6}}$

$\dfrac{x^2-x}{2x-x^2-6} \geq 0 \;\wedge\; 2x-x^2-6 \neq 0$

$x_{1,2} = \dfrac{-2 \pm \sqrt{4-24}}{-2} \notin R$

Пошто је: $a=-1<0$, биће:

$\left.\begin{array}{l} 2x-x^2-6<0 \\ \dfrac{x^2-x}{2x-x^2-6} \geq 0 \end{array}\right\} \Rightarrow \begin{array}{l} x^2-x \leq 0 \\ x(x-1) \leq 0 \end{array}$

$D_f: x \in [0,1]$

4) $f(x) = \ln \dfrac{4-2x}{3x^2+5x}$

$\dfrac{4-2x}{3x^2+5x} > 0 \;\wedge\; 3x^2+5x \neq 0 \Rightarrow x(3x+5) \neq 0$

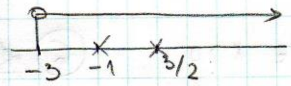
$x \neq 0 \wedge x \neq -\frac{5}{3}$

	$-5/3$	0	2	
++	++	++	−−	$4-2x$
++	−−	+++	+	$3x^2+5x$
+	−	+	−	$\dfrac{4-2x}{3x^2+5x}$

$D_f: x \in (-\infty, -\frac{5}{3}) \cup (0, 2)$

5) $f(x) = \ln(x+3) + \dfrac{3}{2x^2-x-3}$

$x+3>0 \;\wedge\; 2x^2-x-3 \neq 0 \Rightarrow x_{1,2} \neq \dfrac{1 \pm 5}{4} \neq \begin{matrix} \frac{3}{2} \\ -1 \end{matrix}$

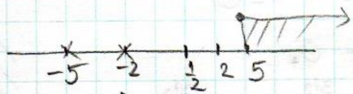


$D_f: x \in (-3, -1) \cup (-1, \frac{3}{2}) \cup (\frac{3}{2}, +\infty)$

6) $f(x) = \dfrac{\sqrt{x-5}}{x^2-4} - \ln(2x^2+9x-5)$

$x-5 \geq 0 \wedge x^2-4 \neq 0 \wedge \quad 2x^2+9x-5>0$

$x \geq 5 \;\wedge\; x \neq \pm 2 \;\wedge\; x_{1,2} = \dfrac{-9 \pm 11}{4} = \begin{matrix} \frac{1}{2} \\ -5 \end{matrix}$



$D_f: x \in [5, +\infty)$

7) $f(x) = \sqrt{\log(5x^2-3x)}$

$\log(5x^2-3x) \geq 0 \;\wedge\; 5x^2-3x>0$

$5x^2-3x \geq 1 \qquad \wedge \qquad x(5x-3)>0$

$5x^2-3x-1 \geq 0 \qquad \wedge \qquad x_{1,2} = \begin{matrix} 0 \\ \frac{3}{5} \end{matrix}$

$x_{1,2} = \dfrac{3 \pm \sqrt{29}}{10}$

$x \in \left(-\infty, \frac{3-\sqrt{29}}{10}\right) \cup \left(\frac{3+\sqrt{29}}{10}, +\infty\right)$