

# GRAFICE DE FUNCTII

Trasati graficul urmatorilor functii  $f: D_f \rightarrow \mathbb{R}$ ,

$$1) f(x) = \sqrt{\frac{x-1}{x}}$$

$$2) f(x) = 3x^5 + 5x^3$$

$$3) f(x) = x^2 \cdot \ln x$$

$$4) f(x) = \frac{x^2 - 1}{x^2 + 1}$$

$$5) f(x) = \frac{2x-1}{x^2}$$

$$6) f(x) = \frac{x^2}{x+1}$$

$$7) f(x) = (x^2 - x)e^x$$

$$8) f(x) = x \cdot e^{\frac{1}{x}}$$

$$9) f(x) = \ln \frac{1+x}{x}$$

$$10) f(x) = x \cdot \sqrt{1-x^2}$$

Trasati Gr pentru  $f: D_f \rightarrow \mathbb{R}, f(x) = \sqrt{\frac{x-1}{x}}$

E1)  $D_f = ?$

Cond.:  $\frac{x-1}{x} \geq 0$

$\Rightarrow x \in (-\infty; 0) \cup [1; \infty)$

		0	1	
$x-1$		-	-	0
$x$		-	-	0
$\frac{x-1}{x}$		+	+	-

$f: (-\infty; 0) \cup [1; \infty) \rightarrow \mathbb{R}, f(x) = \sqrt{\frac{x-1}{x}}$

E2)  $\cap O_y: x=0 \notin D_f \Rightarrow \text{Gr } f \cap O_y$

$\cap O_x: y=0 \Rightarrow f(x)=0 \Rightarrow x-1=0 \Rightarrow x=1 \Rightarrow A(1; 0) \in \text{Gr } f$

E3)  $\lim_{x \rightarrow -\infty} f(x) = \lim_{x \rightarrow -\infty} \sqrt{\frac{x-1}{x}} = 1$

$\lim_{x \rightarrow 0} f(x) = \lim_{x > 0} \sqrt{\frac{x-1}{x}} = \frac{\sqrt{-1}}{0} = \infty$

$f(1) = 0; \lim_{x \rightarrow \infty} f(x) = \lim_{x \rightarrow \infty} \sqrt{\frac{x-1}{x}} = 1$

E4) as. orizontale: de la E3)  $\Rightarrow y=1$  as. oriz la  $\pm\infty$

as. oblice:  $\nexists$  deorece  $\exists$  as. oriz la  $\pm\infty$

as. verticale:  $x=0$  as. verticală la stg

E5)  $f$  continuă pe  $(-\infty; 0) \cup [1; \infty)$  ca și op. cu  $f$  element.

E6)  $f'(x) = \frac{1}{2\sqrt{\frac{x-1}{x}}} \cdot \left(\frac{x-1}{x}\right)' = \frac{1}{2} \cdot \sqrt{\frac{x}{x-1}} \cdot \frac{1 \cdot x - (x-1) \cdot 1}{x^2}$

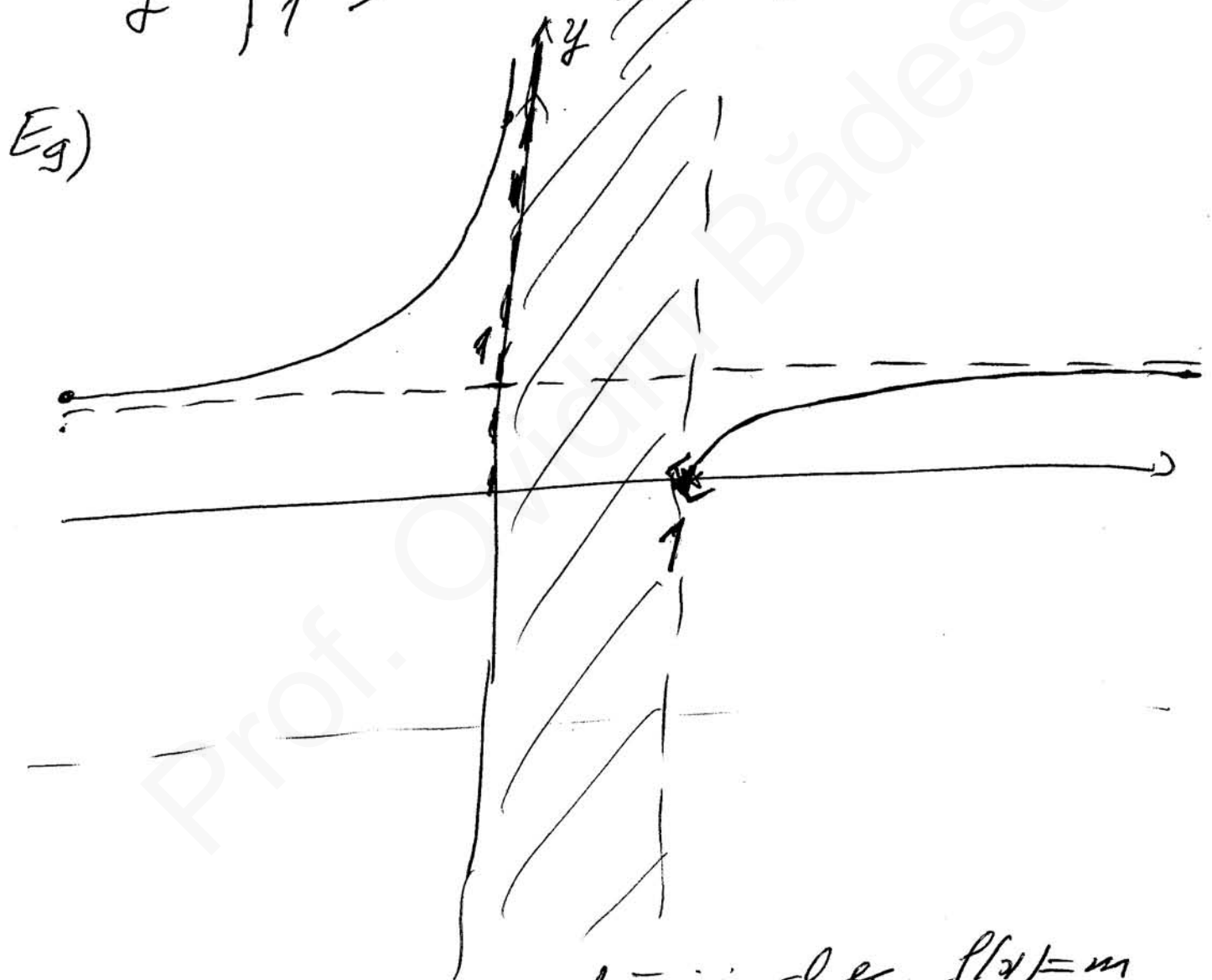
$\frac{1}{2\sqrt{\frac{x-1}{x}}} \cdot \frac{1}{x}; f'(x)=0 \Rightarrow x=0 \notin D_f$

semnul de  $f'(x) = \frac{1}{2} \sqrt{\frac{x}{x-1}} \cdot \frac{1}{x^2} > 0$  pe cã  
 toate pozitive  $\rightarrow f, \uparrow$  pe  $\Delta f$

E<sub>7</sub>)  $f''(x)$  complicat  $\rightarrow$  nu o calculãm

E<sub>8</sub>)

$x$	$-\infty$	$0$	$1$	$\infty$
$f'$	$+$	$+$	$+$	$+$
$f$	$1$	$\infty$	$0$	$\infty$



E<sub>10</sub>) Discreta  $n$  de rãdãcini al ec.  $f(x) = m$   
 $m \in (-\infty; 0) \Rightarrow \nexists$  rãdãcini |  $m = 1 \Rightarrow \exists$  rãd.  
 $m = 0 \Rightarrow x_1 = 1$  rãd.  
 $m \in (1; \infty) \Rightarrow x_1 \in (-\infty; 0)$