6. $f'(x) = \frac{1}{x} - 1 = \frac{1-x}{x}$

Signe de $1-x$: $1-x>0 \iff -x>-1 \iff x<1$

Signe de x : $x>0$

x	0		1		$+\infty$
$1-x$	‖	$+$	0	$-$	
x	‖	$+$		$+$	
f'	‖	$+$	0	$-$	
f	‖	$-\infty$ ↗	$f(1)$	↘	$-\infty$

$$\lim_{\substack{x\to 0 \\ x>0}} f(x) = -\infty - 0 - 1 = -\infty$$

$$f(1) = \ln(1) - 1 - 1 = 0 - 2 = -2$$

$$\lim_{x\to+\infty} f(x) = x\left(\frac{\ln x}{x} - 1 - \frac{1}{x}\right) = +\infty\left(0 - 1 + 0\right) = -\infty$$