

$x$	$-1$	$3$	$8$	$+\infty$
$\varphi''$			-	
$\varphi'$	$+\infty$	0		$-\infty$
$\varphi$	$\frac{3}{8}$	$\frac{27}{8}$	0	$-\infty$

The table illustrates the behavior of the function  $\varphi$  and its derivatives across different intervals of  $x$ . The critical points are  $x = -1$ ,  $x = 3$ , and  $x = 8$ . The second derivative  $\varphi''$  is negative for  $x > 3$ . The first derivative  $\varphi'$  is positive for  $x < 3$  and negative for  $x > 3$ . The function  $\varphi$  is increasing for  $x < 3$  and decreasing for  $x > 3$ .