

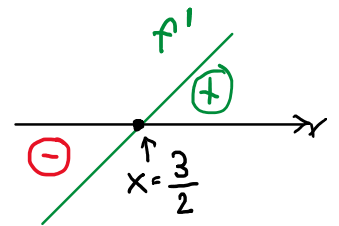
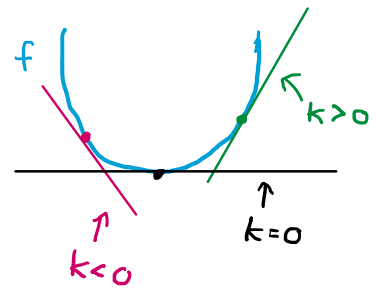
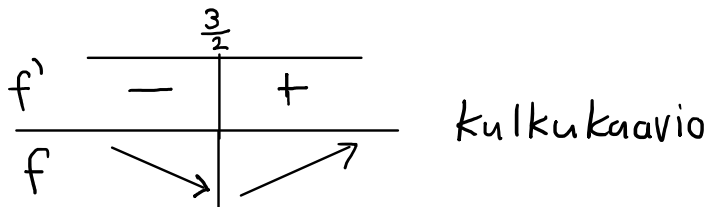
esim. $f(x) = 3x^2 - 9x + 10$

- derivoidaan!

$$\underline{f'(x) = 6x - 9}$$

- derivaatan nollakohta

$$\begin{aligned} 6x - 9 &= 0 \\ 6x &= 9 \quad \parallel :6 \\ x &= \frac{9}{6} = \frac{3}{2} \end{aligned}$$

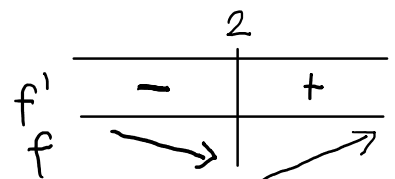
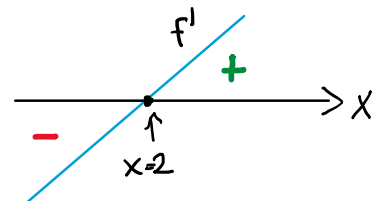


8.3 $f(x) = 3x^2 - 12x + 1$

- $f'(x) = 6x - 12$
- derivaatan nollakohta

$$\begin{aligned} 6x - 12 &= 0 \\ 6x &= 12 \quad \parallel :6 \\ x &= 2 \end{aligned}$$

a) $f'(x) > 0$,
kun $x > 2$



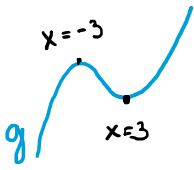
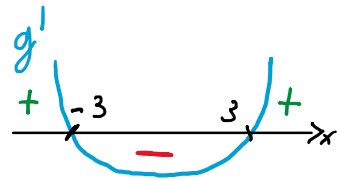
$$g(x) = x^3 - 27x$$

- $g'(x) = 3x^2 - 27$

- $g'(x) = 0 \Leftrightarrow 3x^2 - 27 = 0$
nollakohta $3x^2 = 27 \quad \parallel :3$

$$g' \quad \begin{matrix} + \\ | \\ - \end{matrix} \quad \begin{matrix} + \\ | \\ - \end{matrix}$$

- $g'(x) = 0 \Leftrightarrow 5x^2 - 27 = 0$
nollakohta
 $3x^2 = 27 \quad ||:3$
 $x^2 = 9$
 $x = \pm\sqrt{9}$
 $x = \pm 3$
 $x = -3$ tai $x = 3$



	-3	3	
g'	+	-	+
g	↗	↘	↗

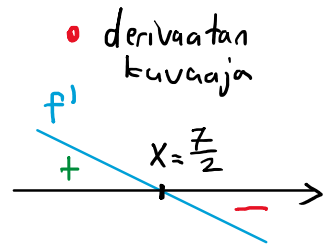
b) $g'(x) < 0$,
kun $-3 < x < 3$

8.7

$f(x) = -x^2 + 7x - 1$

- $f'(x) = -2x + 7$

- nollakohta $-2x + 7 = 0$
 $-2x = -7 \quad ||:(-2)$
 $x = \frac{7}{2}$



• kulkukaavio

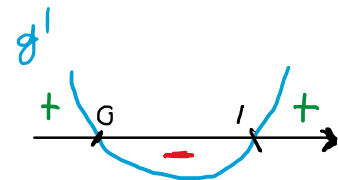
	$\frac{7}{2}$	
f'	+	-
f	↗	↘

b) $f'(x) > 0$, kun $x < \frac{7}{2}$

$g(x) = 2x^3 - 3x^2$

- $g'(x) = 6x^2 - 6x$

- nollakohta $6x^2 - 6x = 0$
 $x(6x - 6) = 0$
 $x = 0$ tai $6x - 6 = 0$
 $6x = 6 \quad ||:6$
 $x = 1$



	0	1	
g'	+	-	+
g	↗	↘	↗

a) $g'(x) \leq 0$, kun $0 < x < 1$