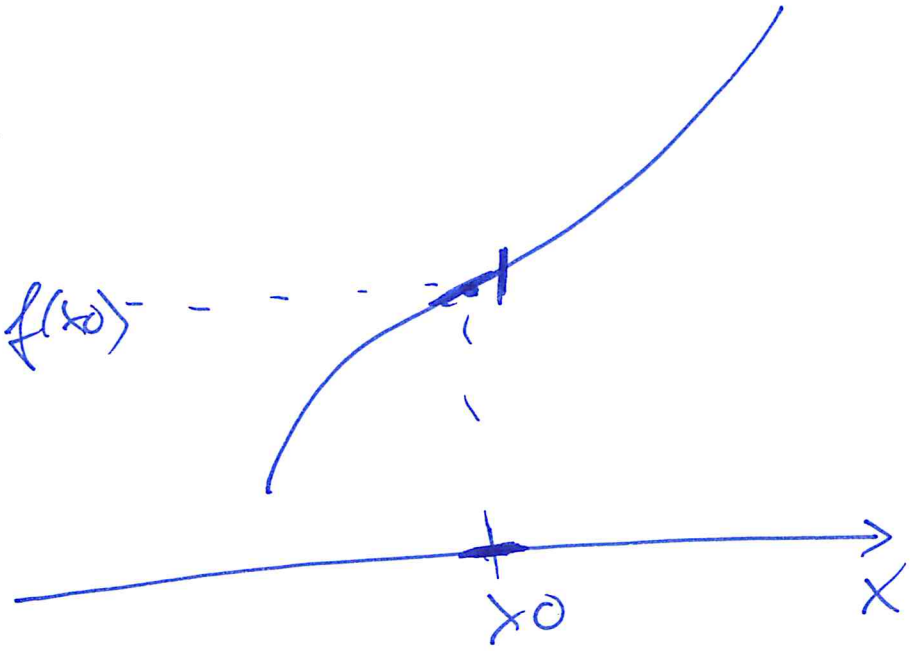
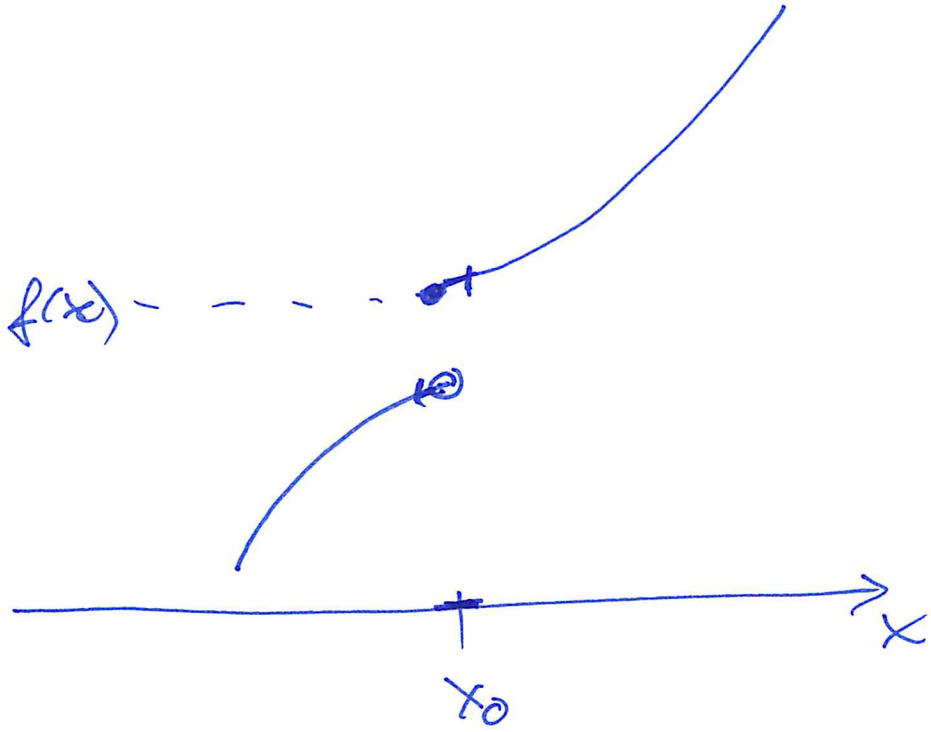
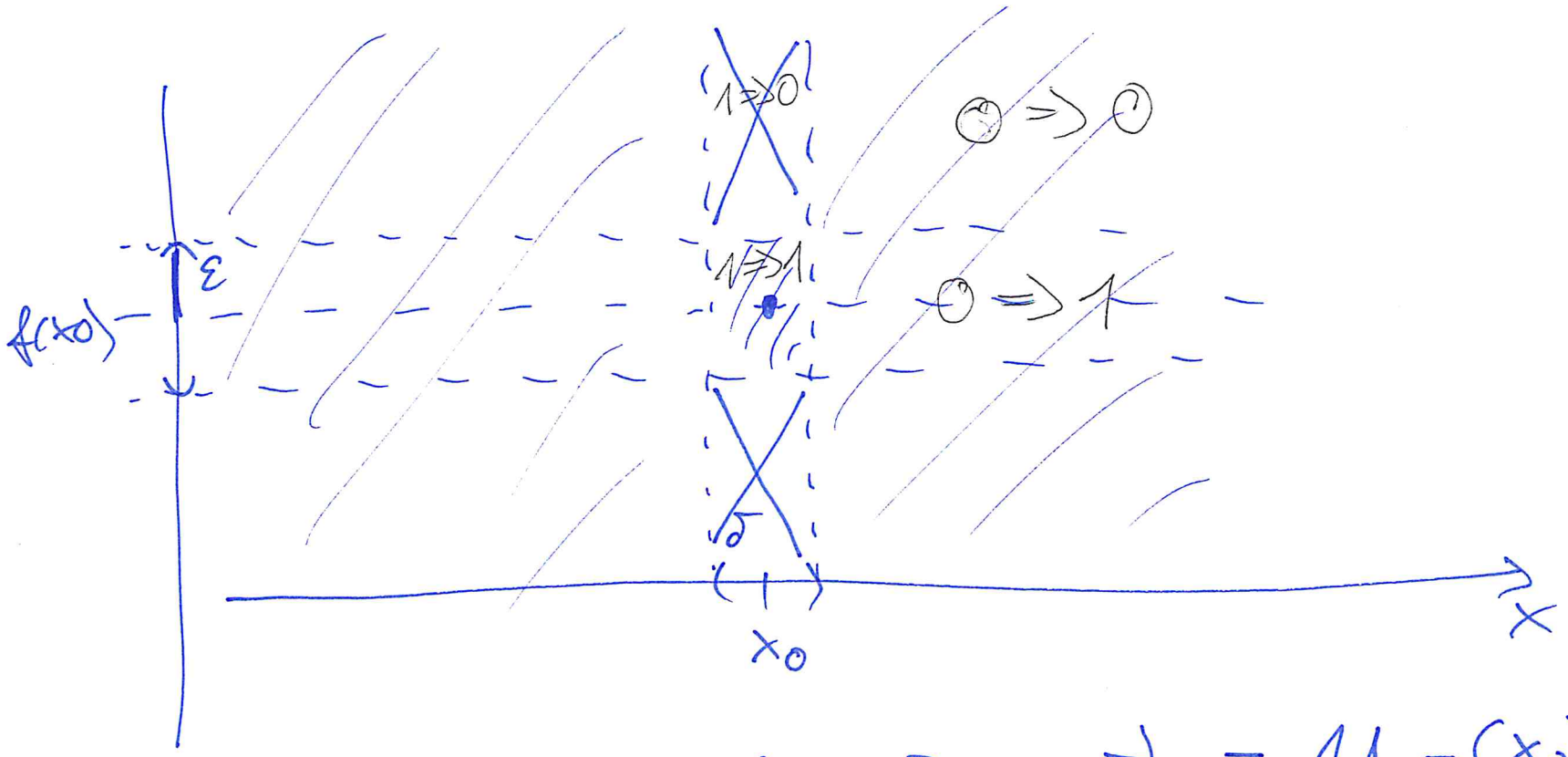
Spojitost funkce v bodě x_0





„malá" změna x – jak ji upřesníme?



okolí bodu x_0 .... $(x_0 - \delta, x_0 + \delta) = U_\delta(x_0)$

okolí $f(x_0)$ .... $(f(x_0) - \varepsilon, f(x_0) + \varepsilon) = U_\varepsilon(f(x_0))$

$x \in U_\delta(x_0) \Rightarrow f(x) \in U_\varepsilon(f(x_0))$

Definice:

Řekneme, že funkce f je spojitá v bodě x_0, pokud platí

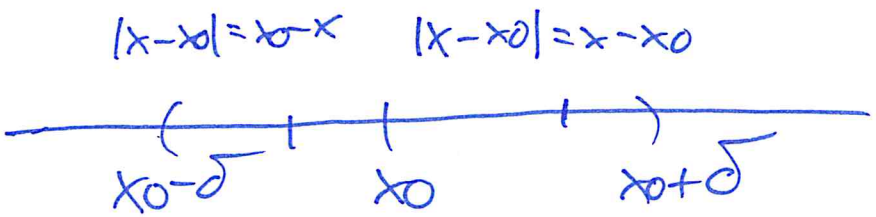
$$(\forall \varepsilon > 0)(\exists \delta > 0)(\forall x \in U_\delta(x_0))(f(x) \in U_\varepsilon(f(x_0)))$$

nebo též

$$(\forall \varepsilon > 0)(\exists \delta > 0)(\forall x)(x \in U_\delta(x_0) \Rightarrow f(x) \in U_\varepsilon(f(x_0)))$$

$x \in U_\delta(x_0)$

$x \in (x_0 - \delta, x_0 + \delta)$



$|x - x_0| < \delta$

$f(x) \in U_\varepsilon(f(x_0))$

$f(x) \in (f(x_0) - \varepsilon, f(x_0) + \varepsilon)$

$|f(x) - f(x_0)| < \varepsilon$