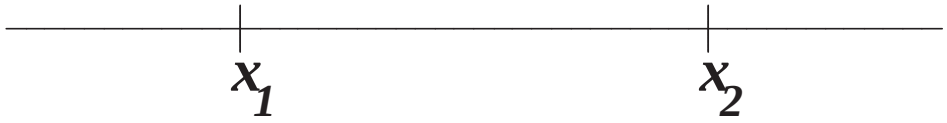
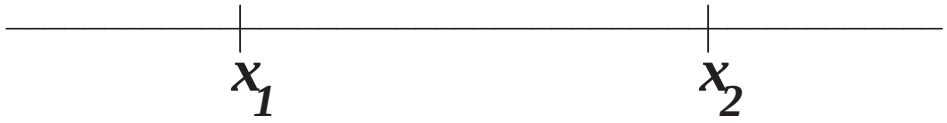
Konvexní kombinace



Konvexní kombinace



$$1 \cdot x_1 + 0 \cdot x_2 = x_1 + 0 \cdot (x_2 - x_1) = x_1$$

Konvexní kombinace

$$1 \cdot x_1 + 0 \cdot x_2 = x_1 + 0 \cdot (x_2 - x_1) = x_1$$

$$0 \cdot x_1 + 1 \cdot x_2 = x_1 + 1 \cdot (x_2 - x_1) = x_2$$

Konvexní kombinace

$$1 \cdot x_1 + 0 \cdot x_2 = x_1 + 0 \cdot (x_2 - x_1) = x_1$$

$$0 \cdot x_1 + 1 \cdot x_2 = x_1 + 1 \cdot (x_2 - x_1) = x_2$$

$$\frac{1}{2}x_1 + \frac{1}{2}x_2 = x_1 + \frac{1}{2}(x_2 - x_1)$$

Konvexní kombinace

$$1 \cdot x_1 + 0 \cdot x_2 = x_1 + 0 \cdot (x_2 - x_1) = x_1$$

$$0 \cdot x_1 + 1 \cdot x_2 = x_1 + 1 \cdot (x_2 - x_1) = x_2$$

$$\frac{1}{2}x_1 + \frac{1}{2}x_2 = x_1 + \frac{1}{2}(x_2 - x_1)$$

$$\frac{3}{4}x_1 + \frac{1}{4}x_2 = x_1 + \frac{1}{4}(x_2 - x_1)$$

Konvexní kombinace

$$1 \cdot x_1 + 0 \cdot x_2 = x_1 + 0 \cdot (x_2 - x_1) = x_1$$

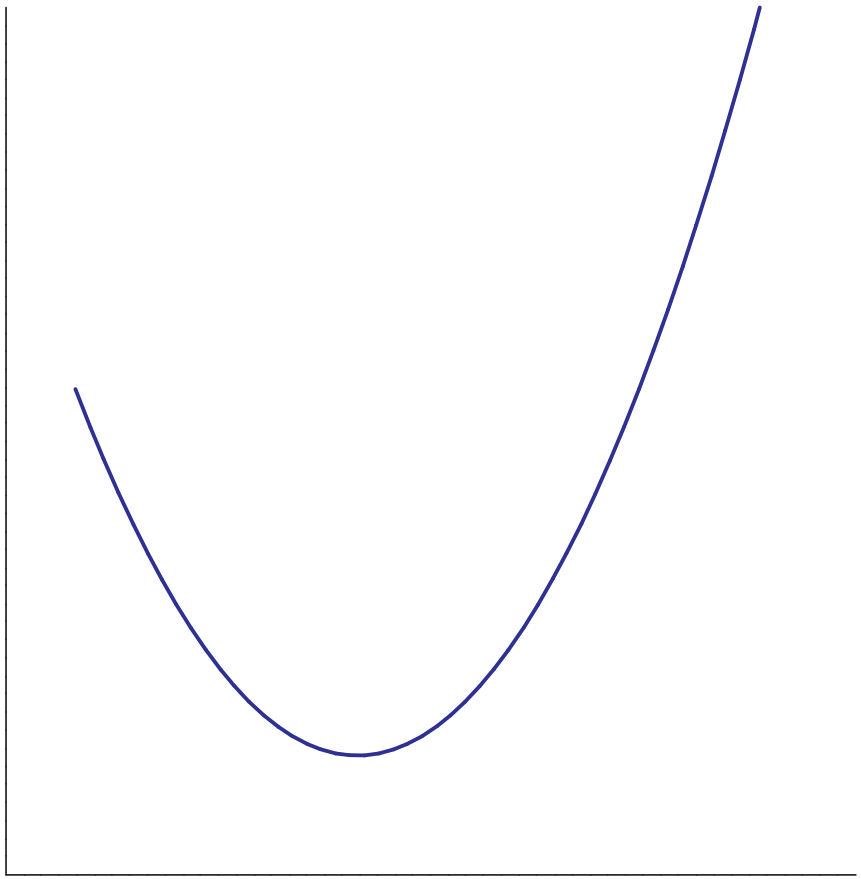
$$0 \cdot x_1 + 1 \cdot x_2 = x_1 + 1 \cdot (x_2 - x_1) = x_2$$

$$\frac{1}{2}x_1 + \frac{1}{2}x_2 = x_1 + \frac{1}{2}(x_2 - x_1)$$

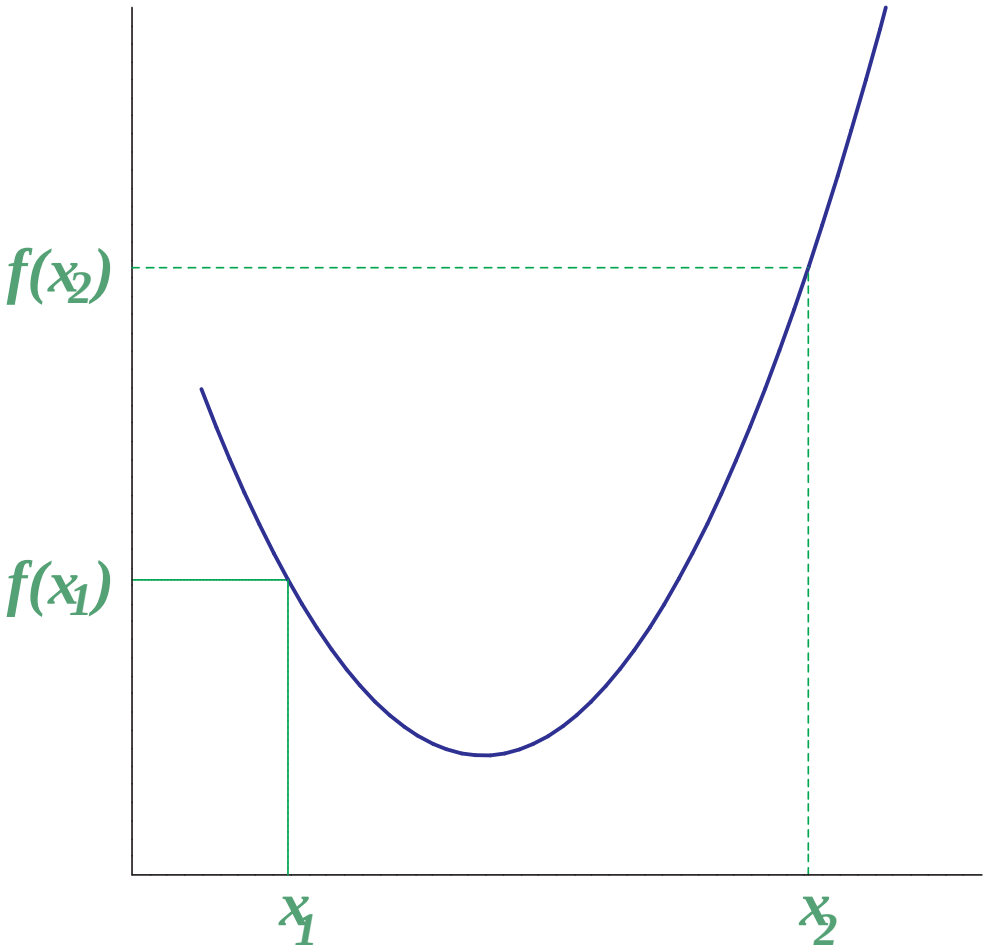
$$\frac{3}{4}x_1 + \frac{1}{4}x_2 = x_1 + \frac{1}{4}(x_2 - x_1)$$

$$\frac{1}{4}x_1 + \frac{3}{4}x_2 = x_1 + \frac{3}{4}(x_2 - x_1)$$

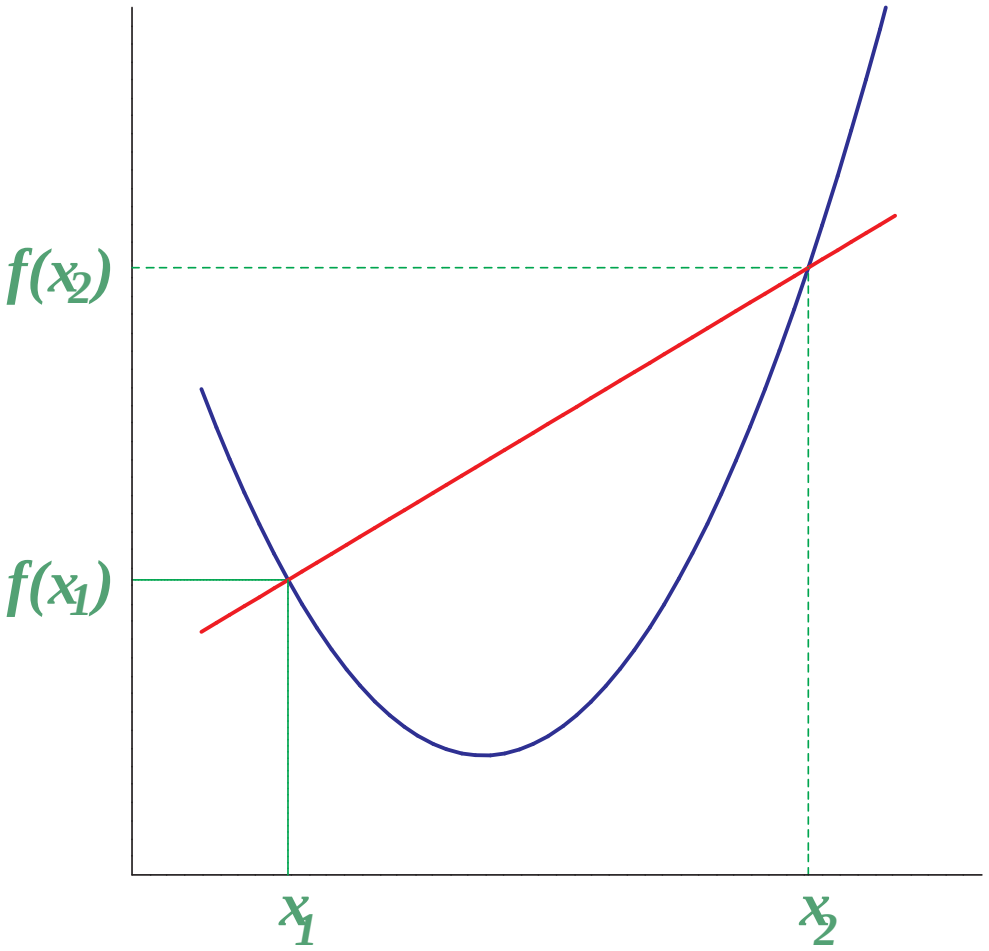
Definice konvexní funkce



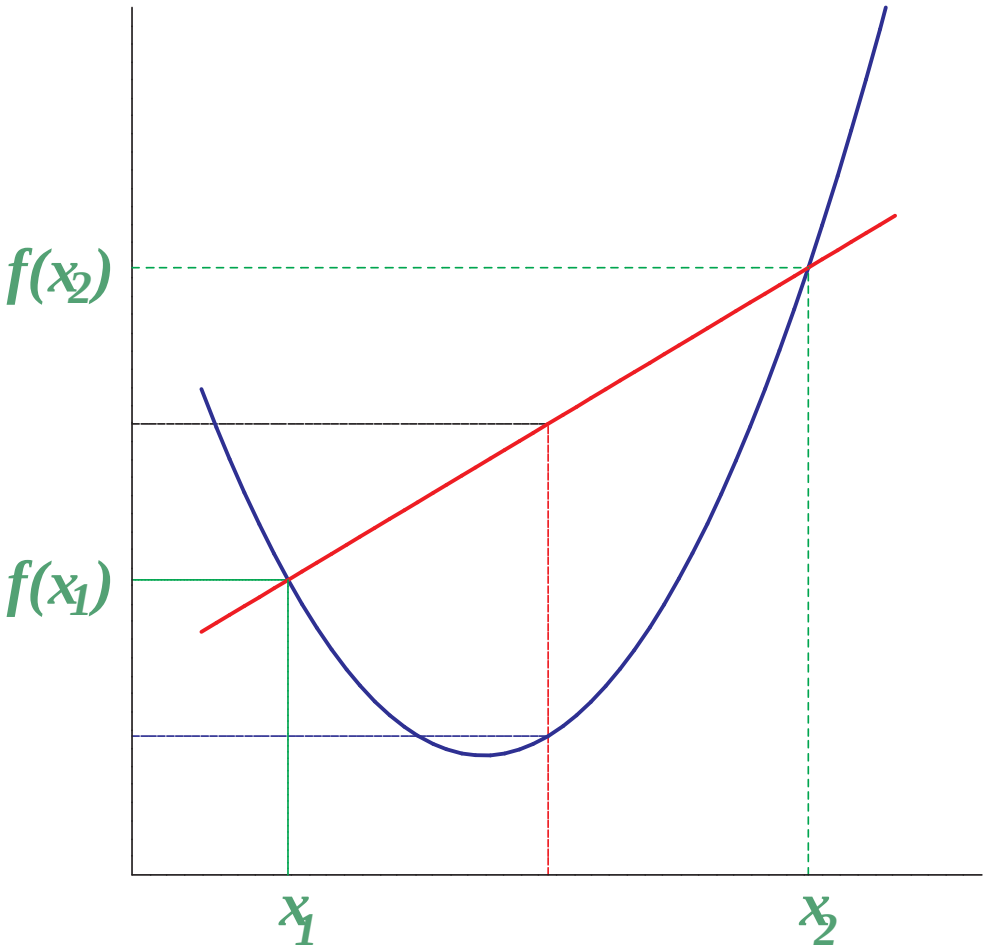
Definice konvexní funkce



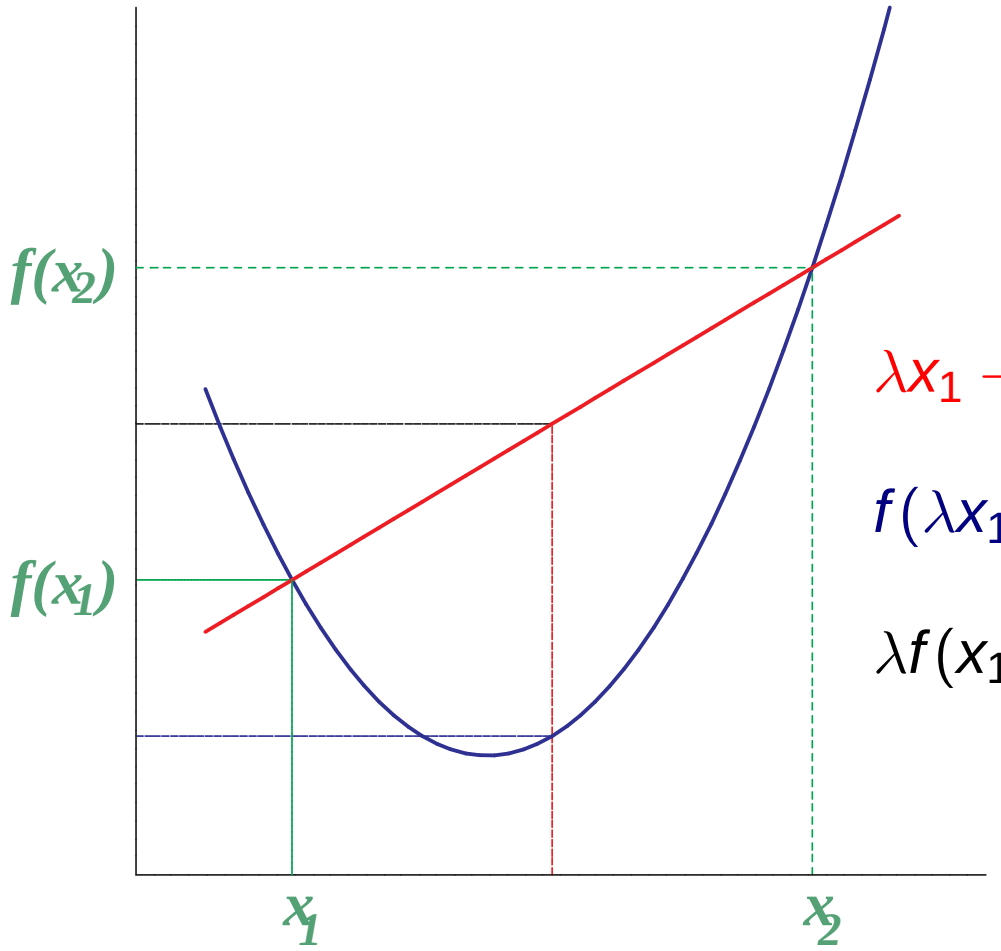
Definice konvexní funkce



Definice konvexní funkce



Definice konvexní funkce

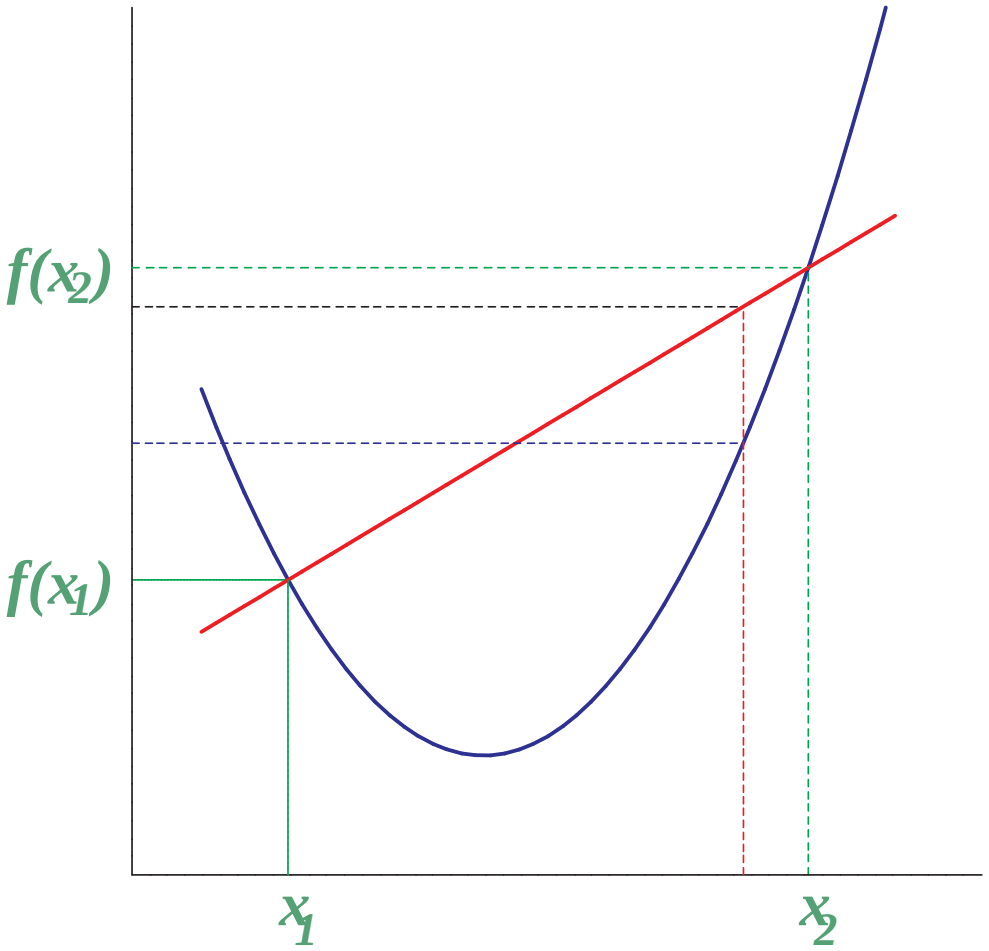


$\lambda x_1 + (1 - \lambda)x_2$

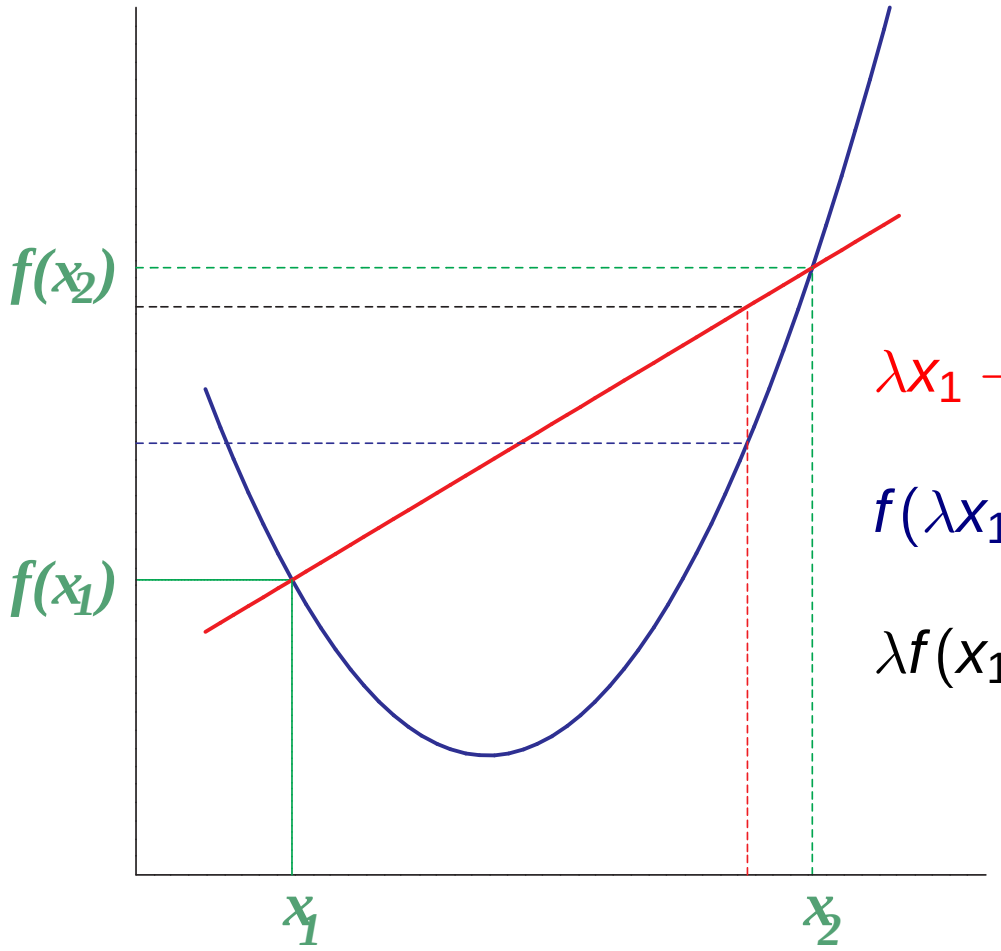
$f(\lambda x_1 + (1 - \lambda)x_2)$

$\lambda f(x_1) + (1 - \lambda)f(x_2)$

Definice konvexní funkce



Definice konvexní funkce

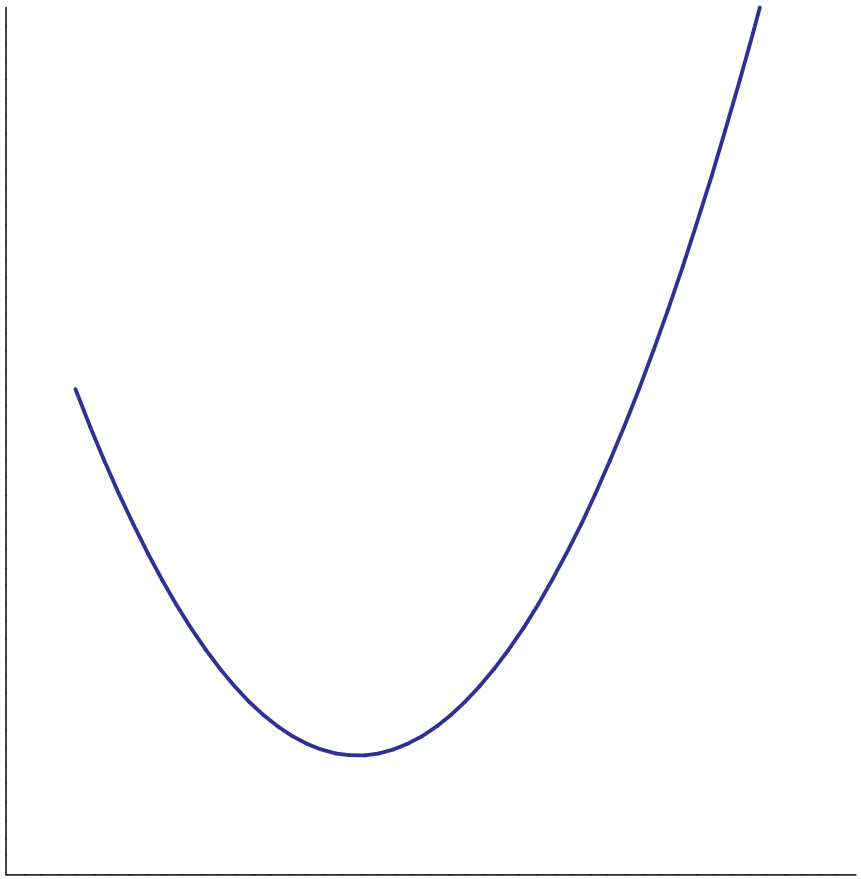


$\lambda x_1 + (1 - \lambda)x_2$

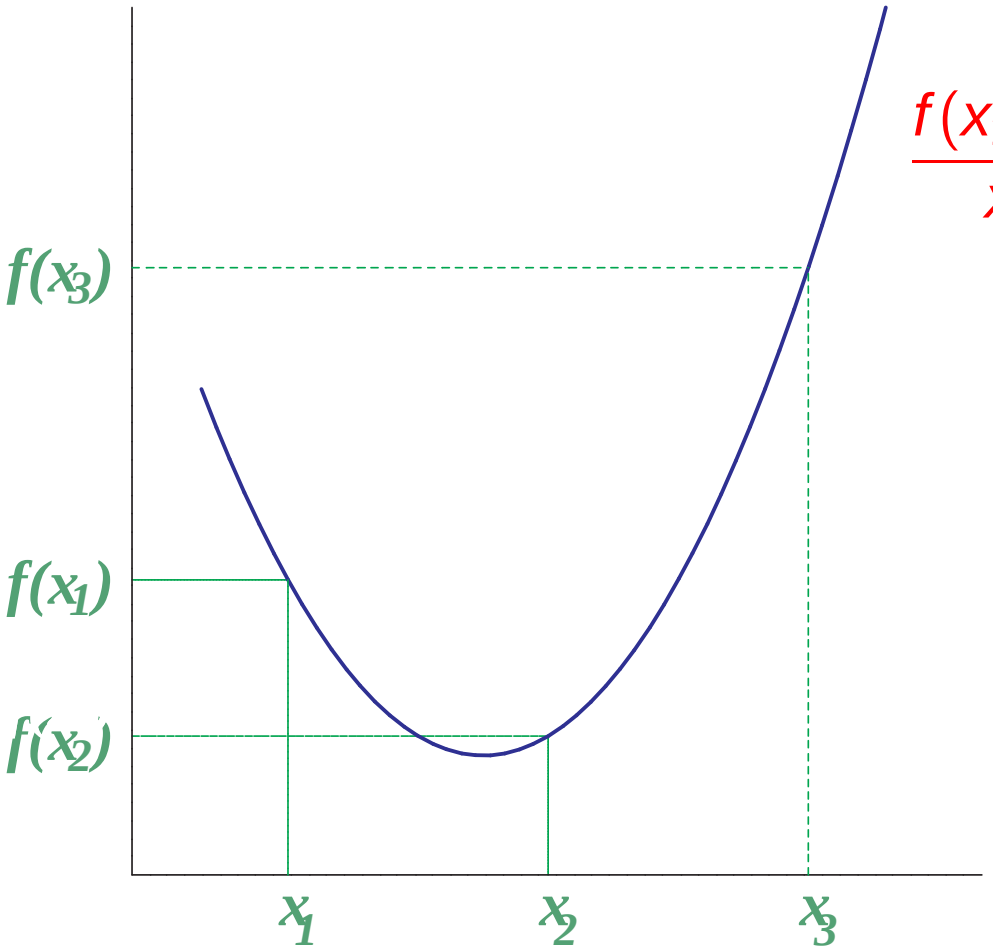
$f(\lambda x_1 + (1 - \lambda)x_2)$

$\lambda f(x_1) + (1 - \lambda)f(x_2)$

Charakterizace konvexních funkcí

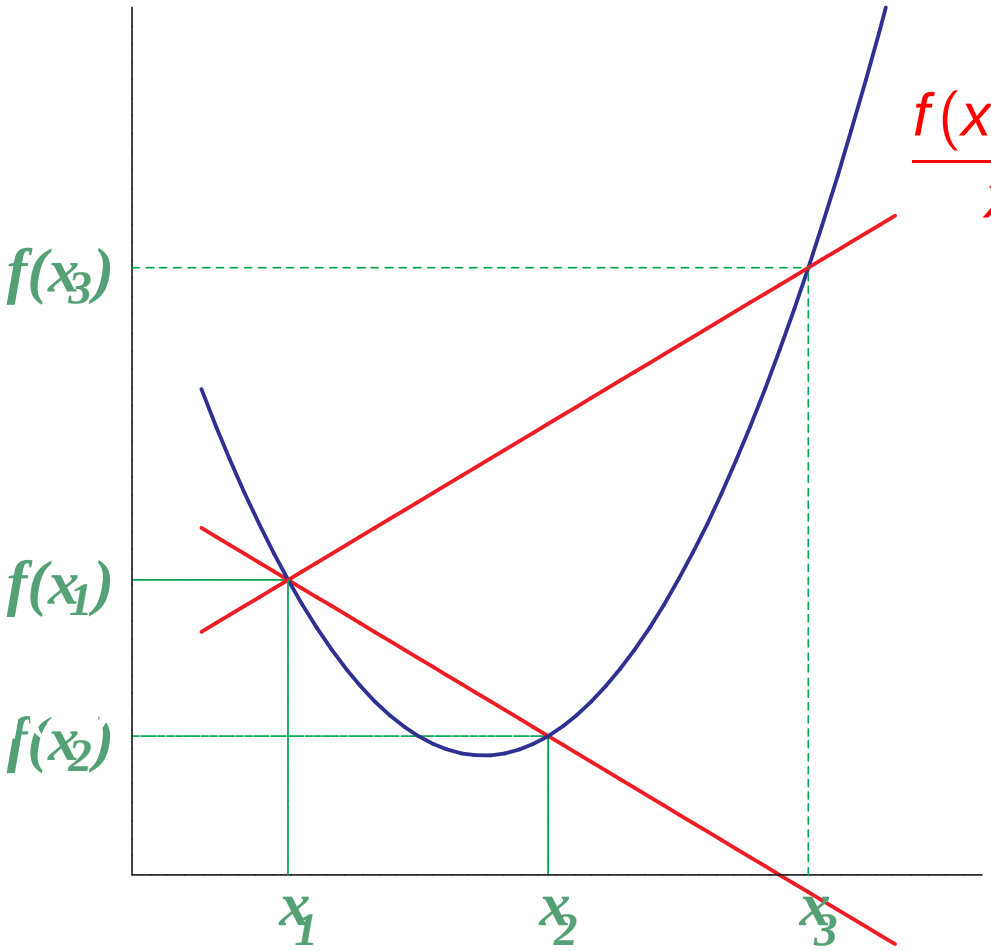


Charakterizace konvexních funkcí



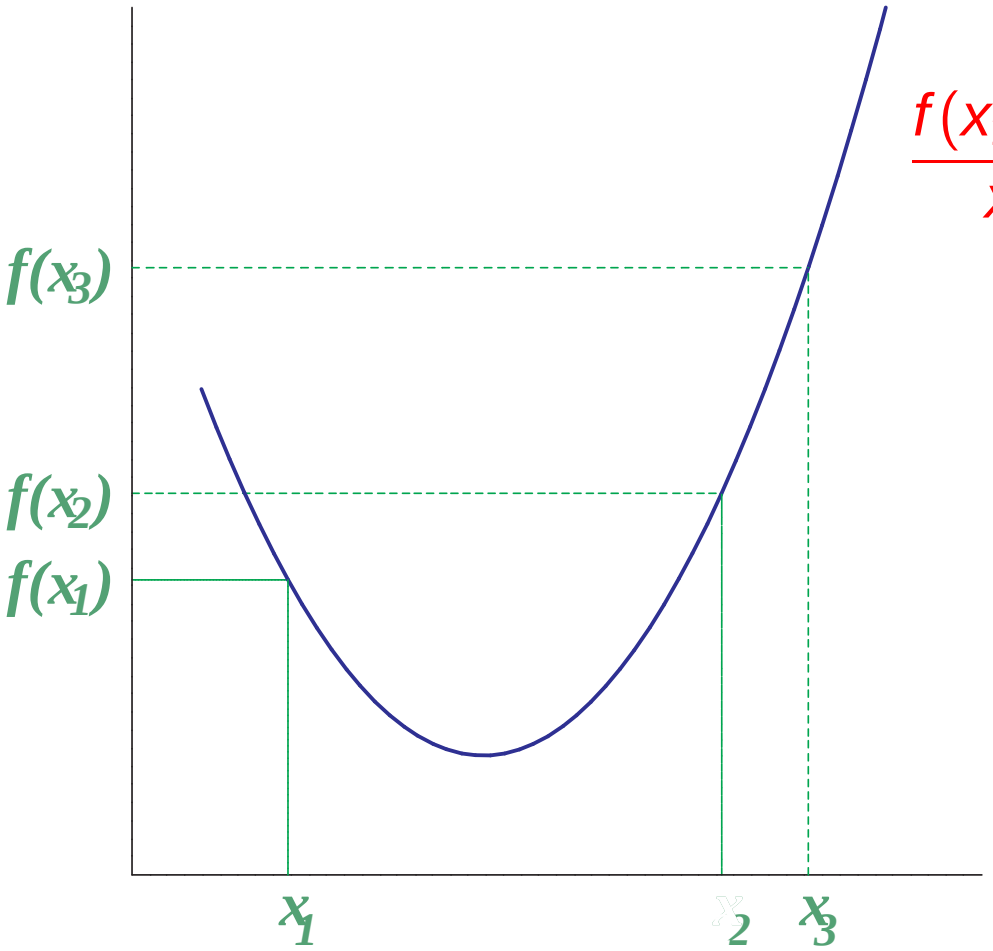
$$\frac{f(x_2) - f(x_1)}{x_2 - x_1} \leq \frac{f(x_3) - f(x_1)}{x_3 - x_1}$$

Charakterizace konvexních funkcí



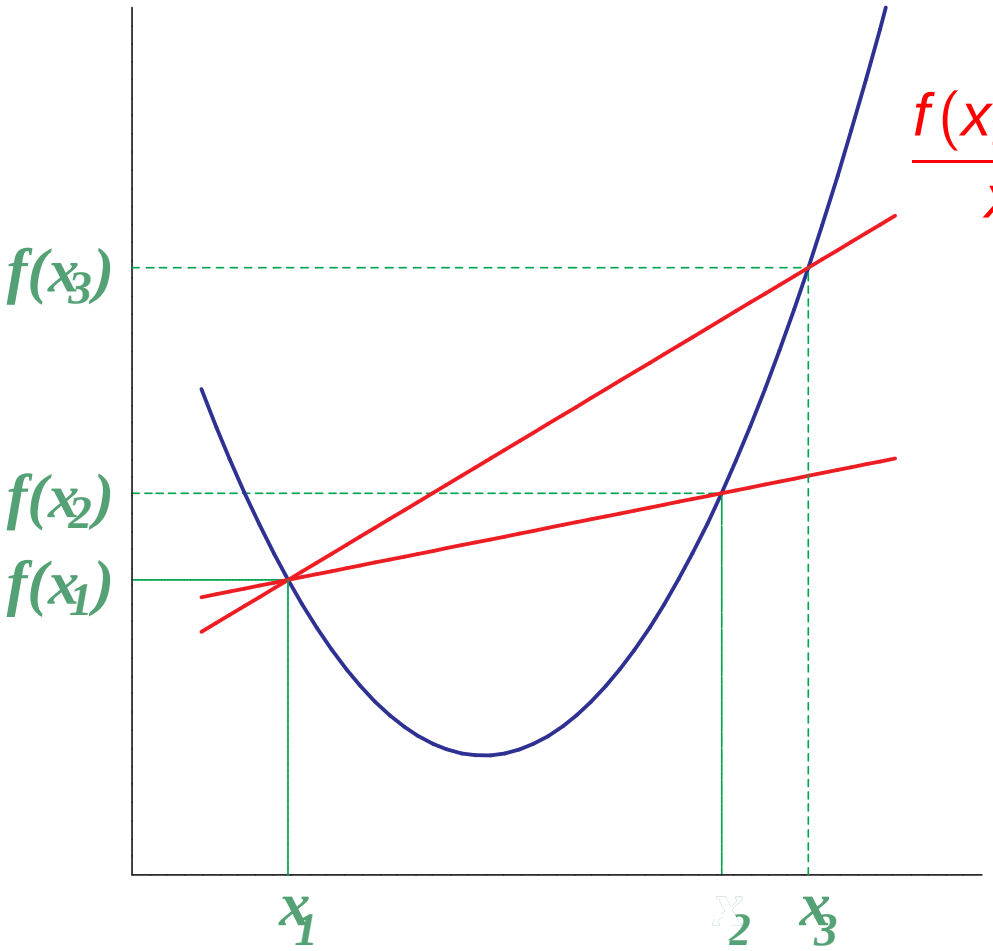
$$\frac{f(x_2) - f(x_1)}{x_2 - x_1} \leq \frac{f(x_3) - f(x_1)}{x_3 - x_1}$$

Charakterizace konvexních funkcí



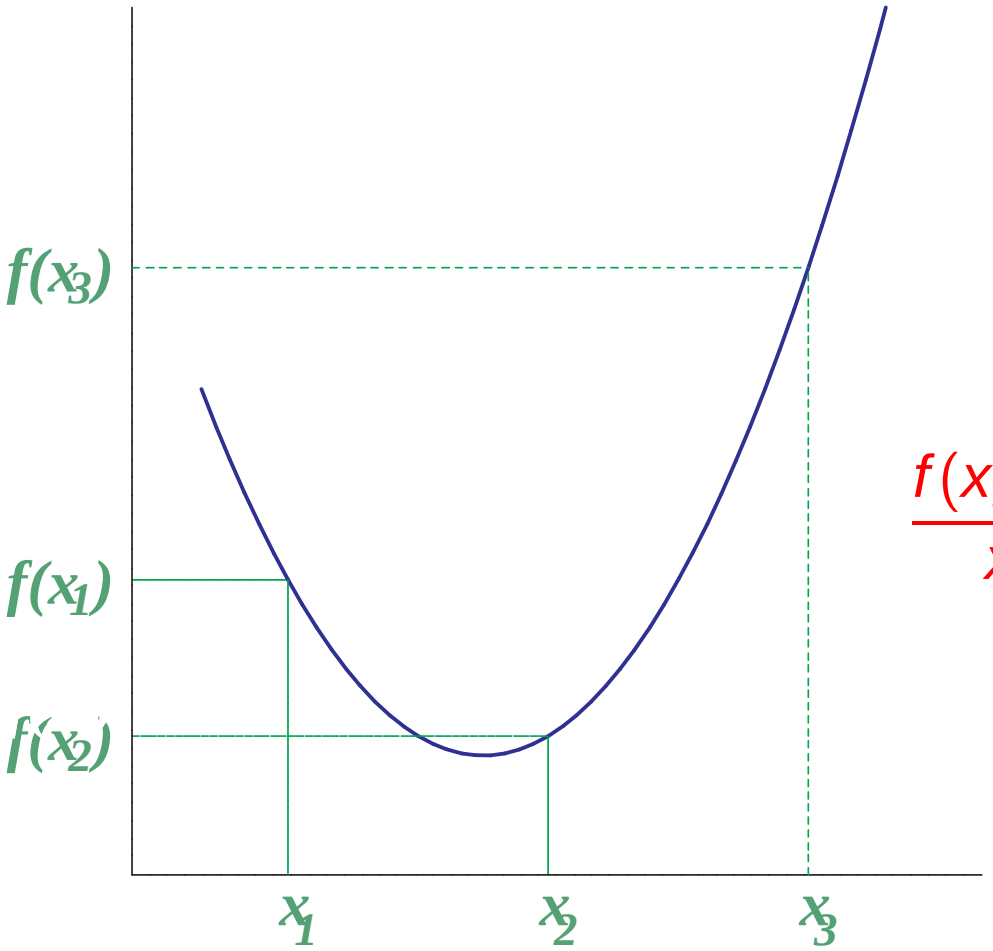
$$\frac{f(x_2) - f(x_1)}{x_2 - x_1} \leq \frac{f(x_3) - f(x_1)}{x_3 - x_1}$$

Charakterizace konvexních funkcí



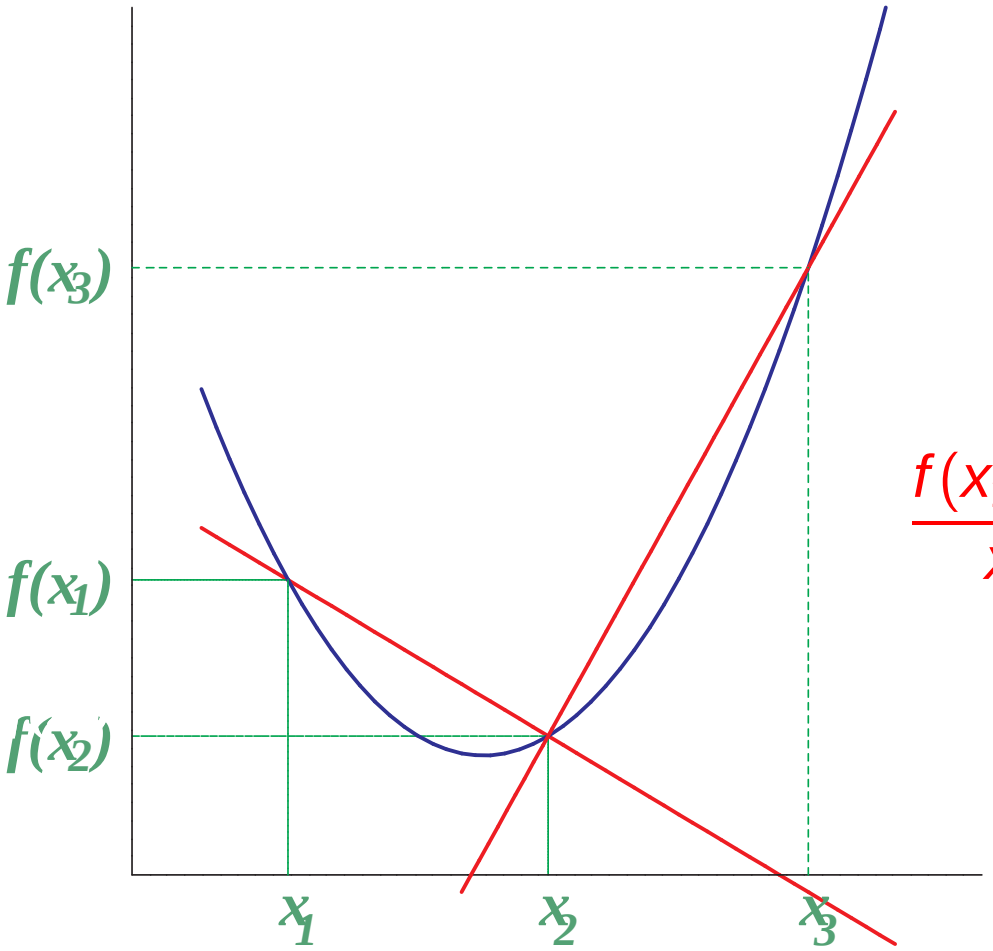
$$\frac{f(x_2) - f(x_1)}{x_2 - x_1} \leq \frac{f(x_3) - f(x_1)}{x_3 - x_1}$$

Charakterizace konvexních funkcí



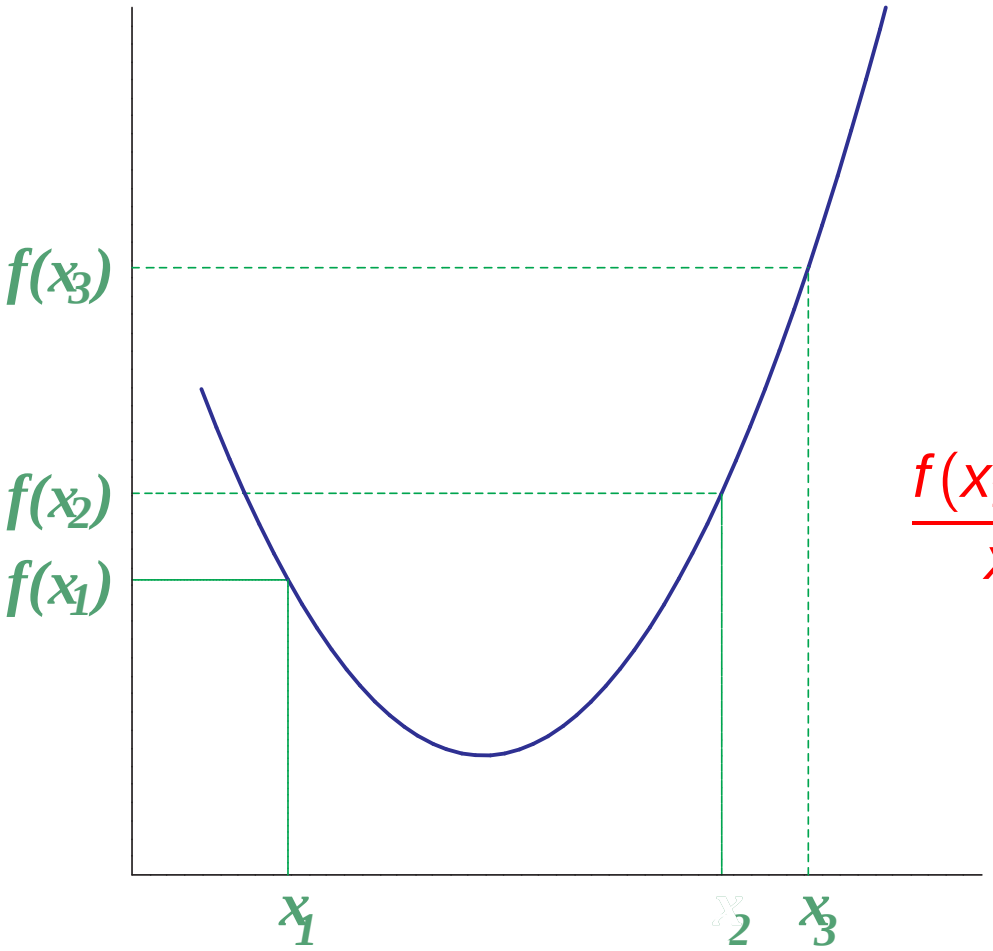
$$\frac{f(x_2) - f(x_1)}{x_2 - x_1} \leq \frac{f(x_3) - f(x_2)}{x_3 - x_2}$$

Charakterizace konvexních funkcí



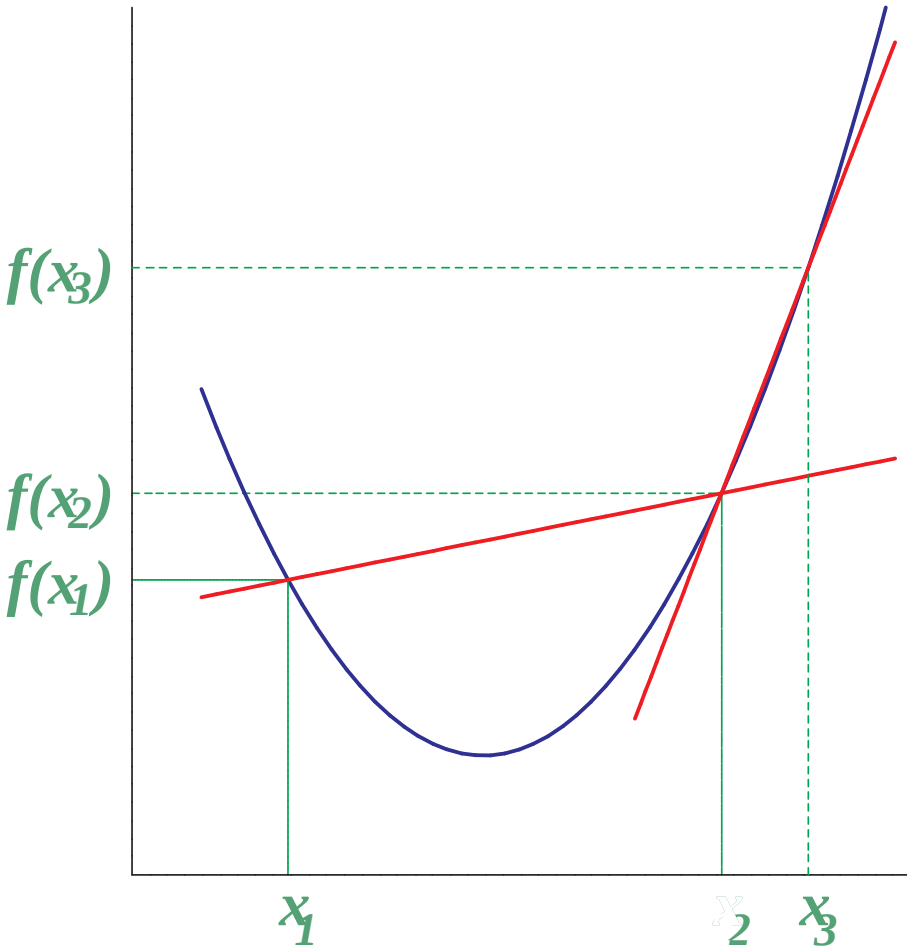
$$\frac{f(x_2) - f(x_1)}{x_2 - x_1} \leq \frac{f(x_3) - f(x_2)}{x_3 - x_2}$$

Charakterizace konvexních funkcí



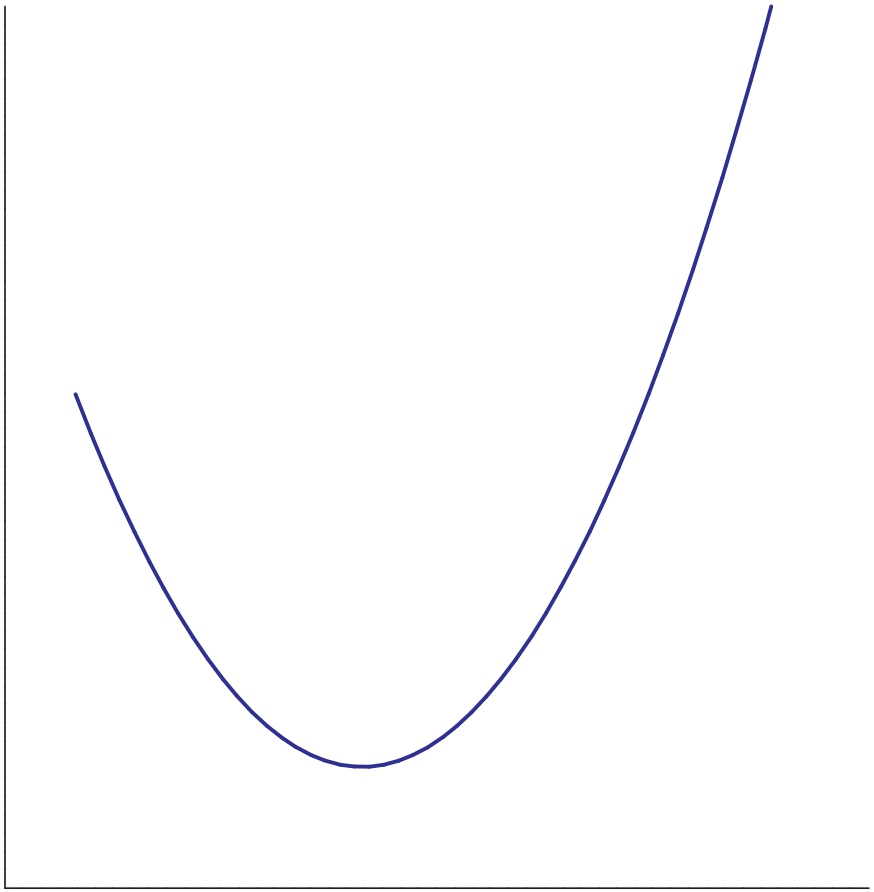
$$\frac{f(x_2) - f(x_1)}{x_2 - x_1} \leq \frac{f(x_3) - f(x_2)}{x_3 - x_2}$$

Charakterizace konvexních funkcí

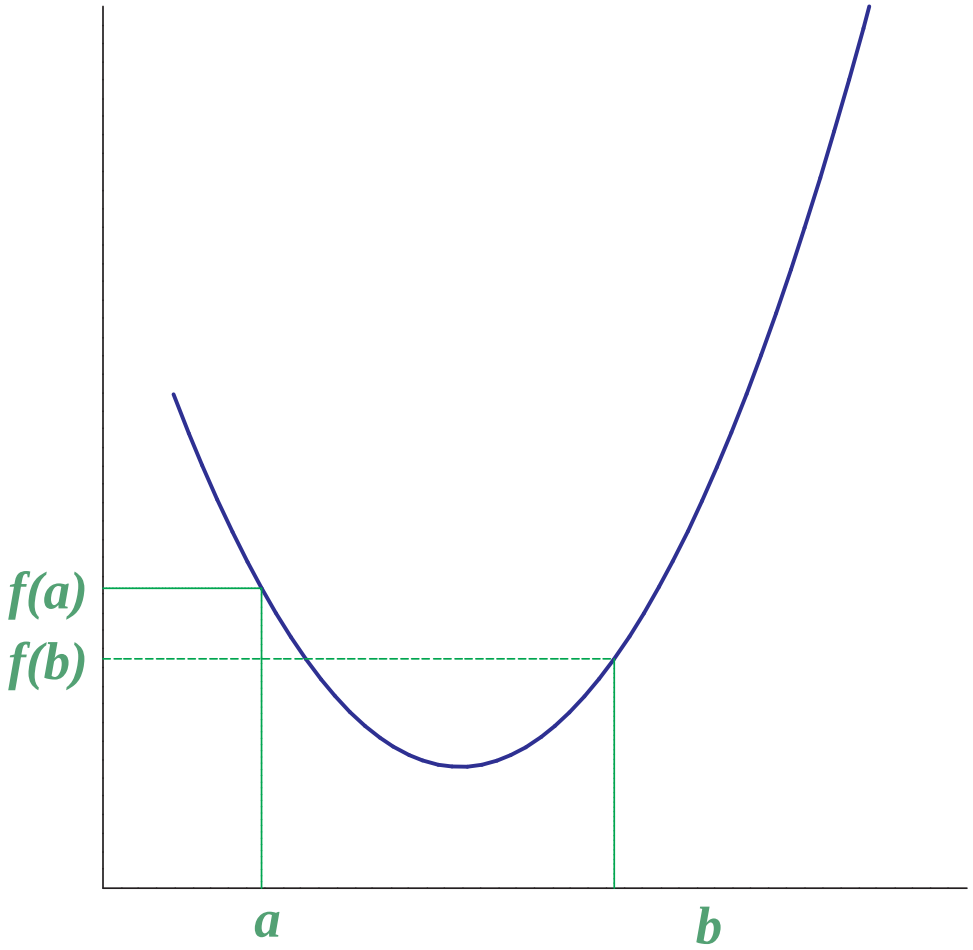


$$\frac{f(x_2) - f(x_1)}{x_2 - x_1} \leq \frac{f(x_3) - f(x_2)}{x_3 - x_2}$$

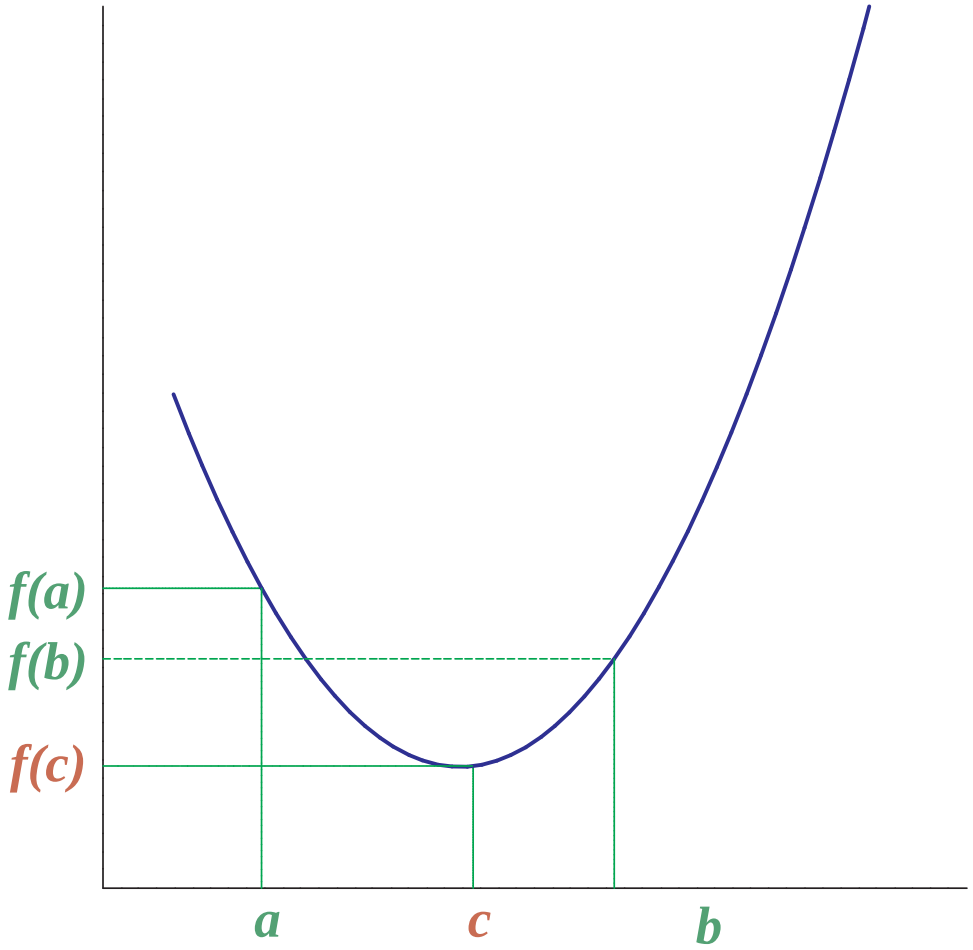
f ryze konvexní $\Rightarrow$ f' rostoucí



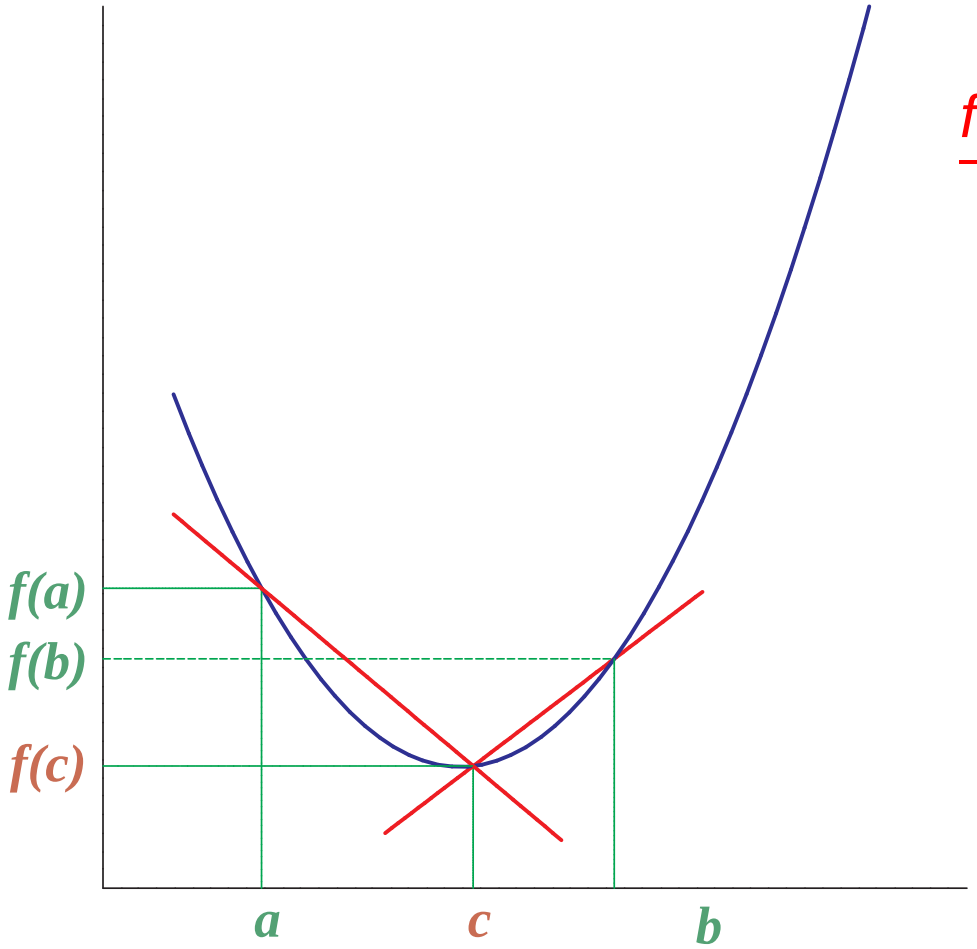
f ryze konvexní $\Rightarrow$ f' rostoucí



f ryze konvexní $\Rightarrow$ f' rostoucí

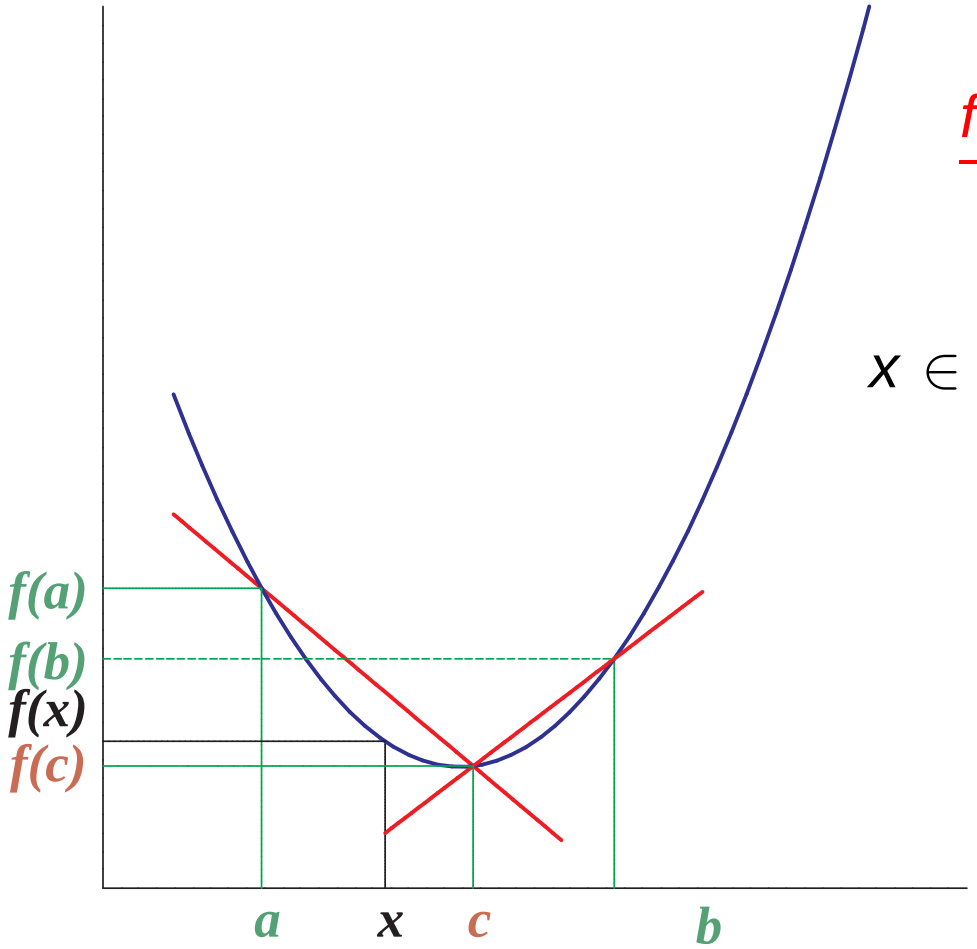


f ryze konvexní $\Rightarrow$ f' rostoucí



$$\frac{f(c)-f(a)}{c-a} < \frac{f(c)-f(b)}{c-b}$$

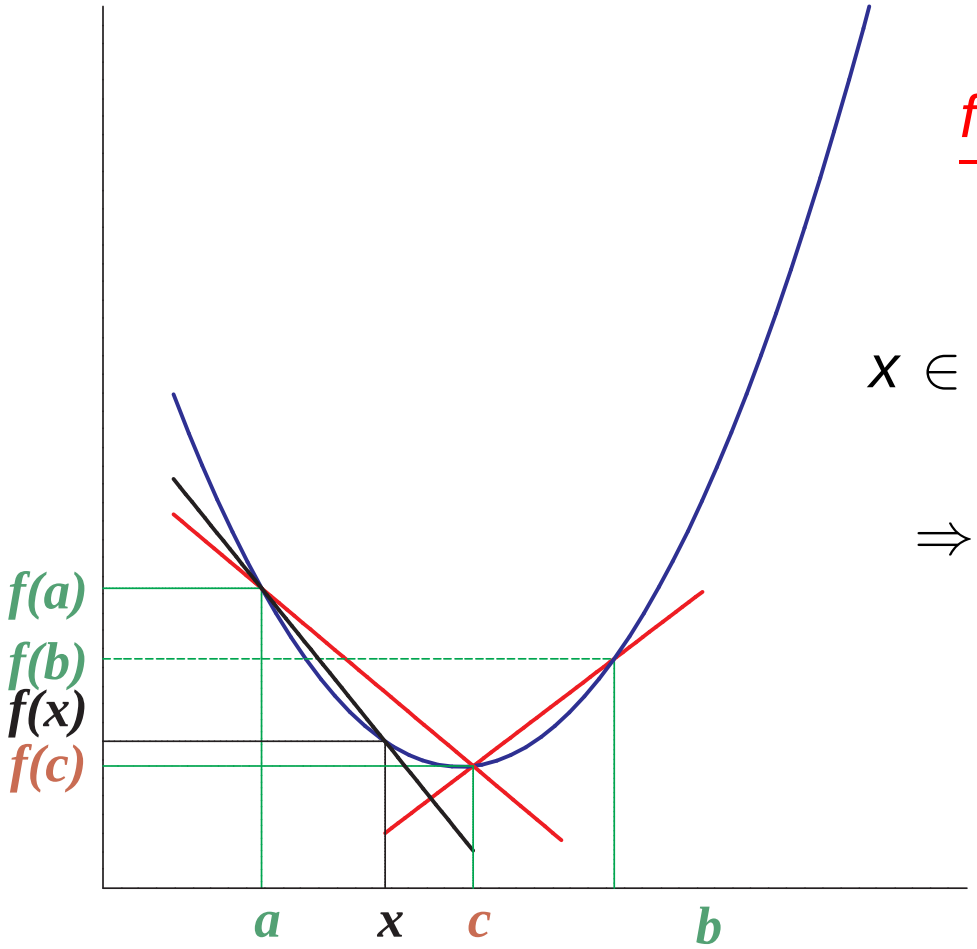
f ryze konvexní $\Rightarrow$ f' rostoucí



$$\frac{f(c)-f(a)}{c-a} < \frac{f(c)-f(b)}{c-b}$$

$x \in (a,c)$

f ryze konvexní $\Rightarrow$ f' rostoucí

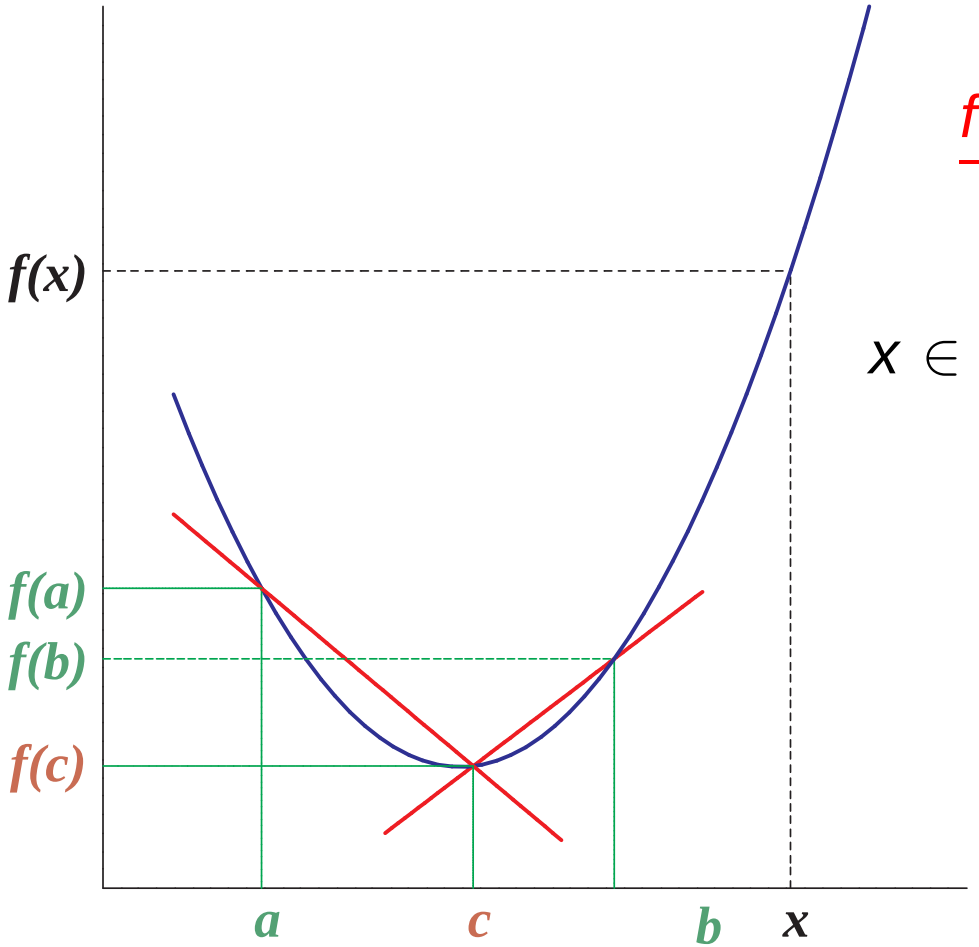


$$\frac{f(c)-f(a)}{c-a} < \frac{f(c)-f(b)}{c-b}$$

$x \in (a,c)$

$$\Rightarrow \frac{f(x)-f(a)}{x-a} \leq \frac{f(c)-f(a)}{c-a}$$

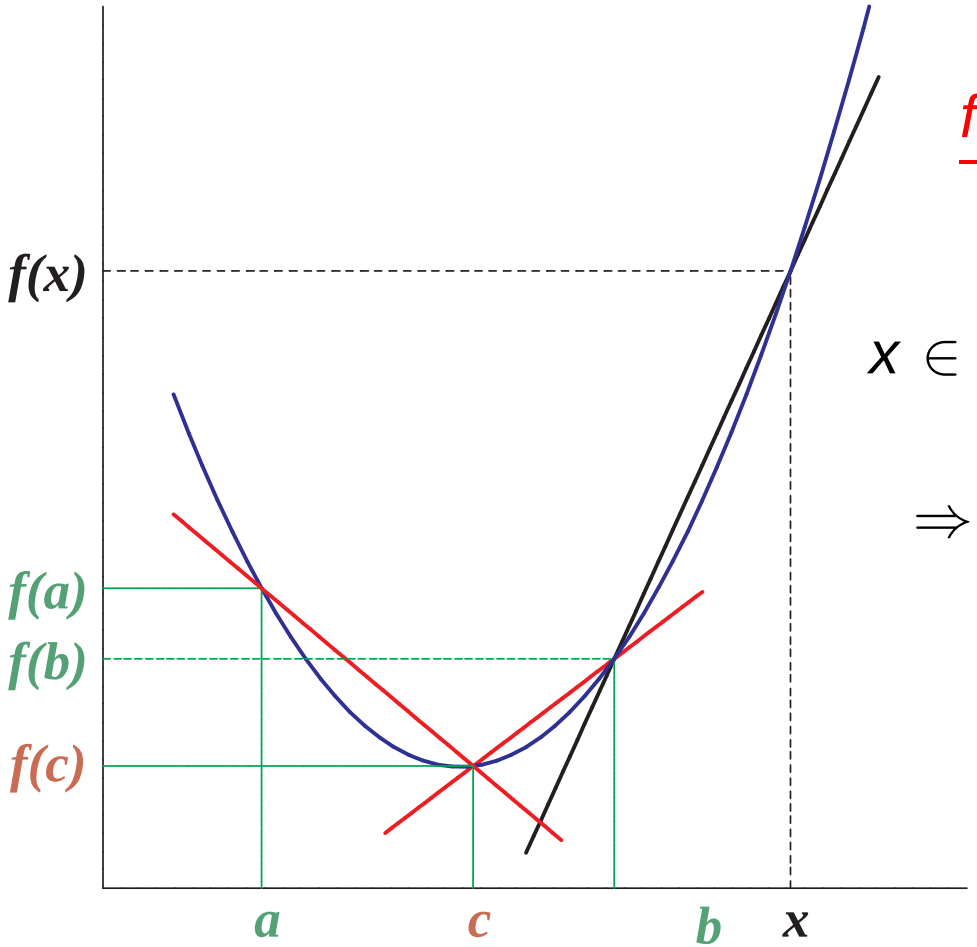
f ryze konvexní $\Rightarrow$ f' rostoucí



$$\frac{f(c)-f(a)}{c-a} < \frac{f(c)-f(b)}{c-b}$$

$x \in I, x > b$

f ryze konvexní $\Rightarrow$ f' rostoucí

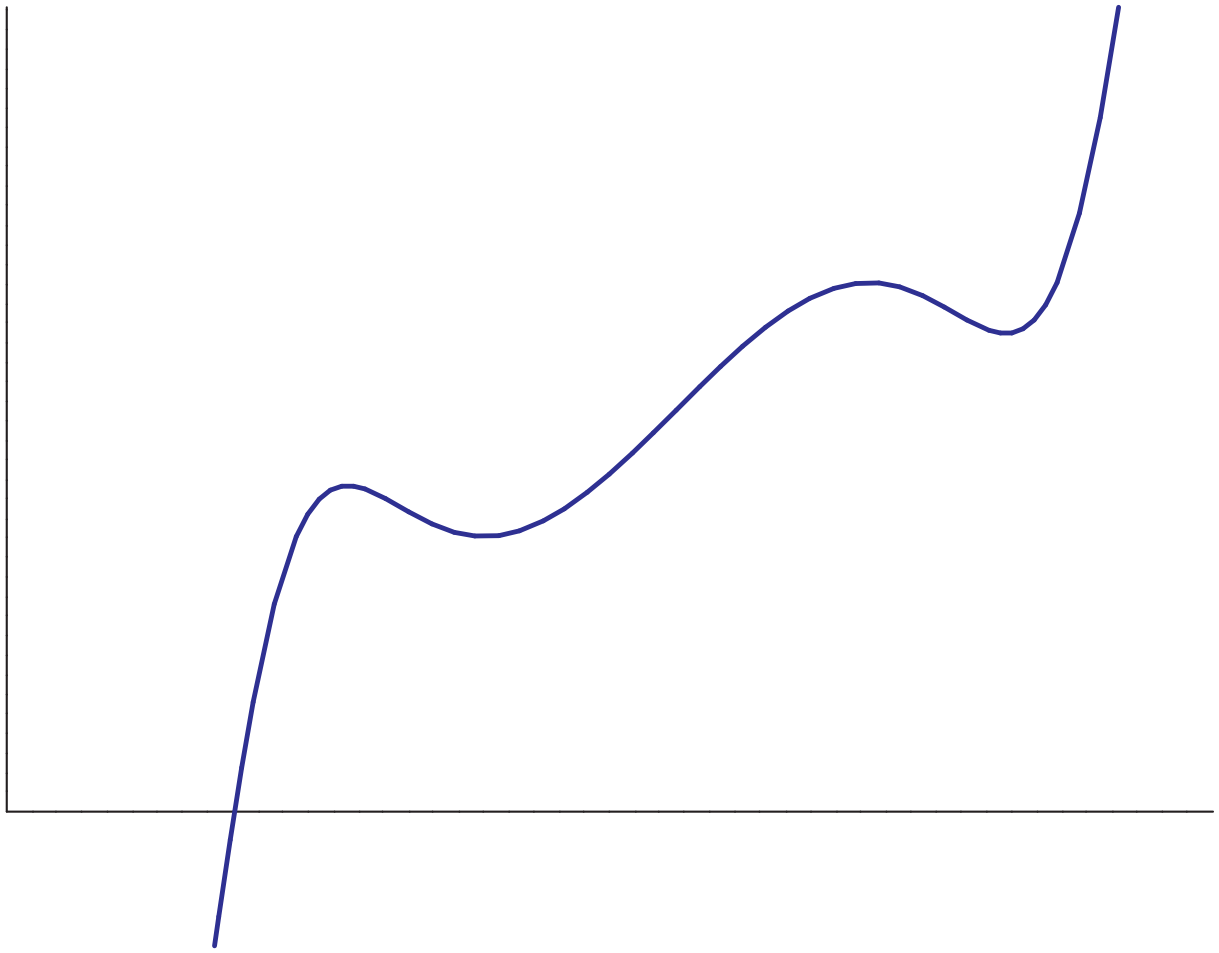


$$\frac{f(c)-f(a)}{c-a} < \frac{f(c)-f(b)}{c-b}$$

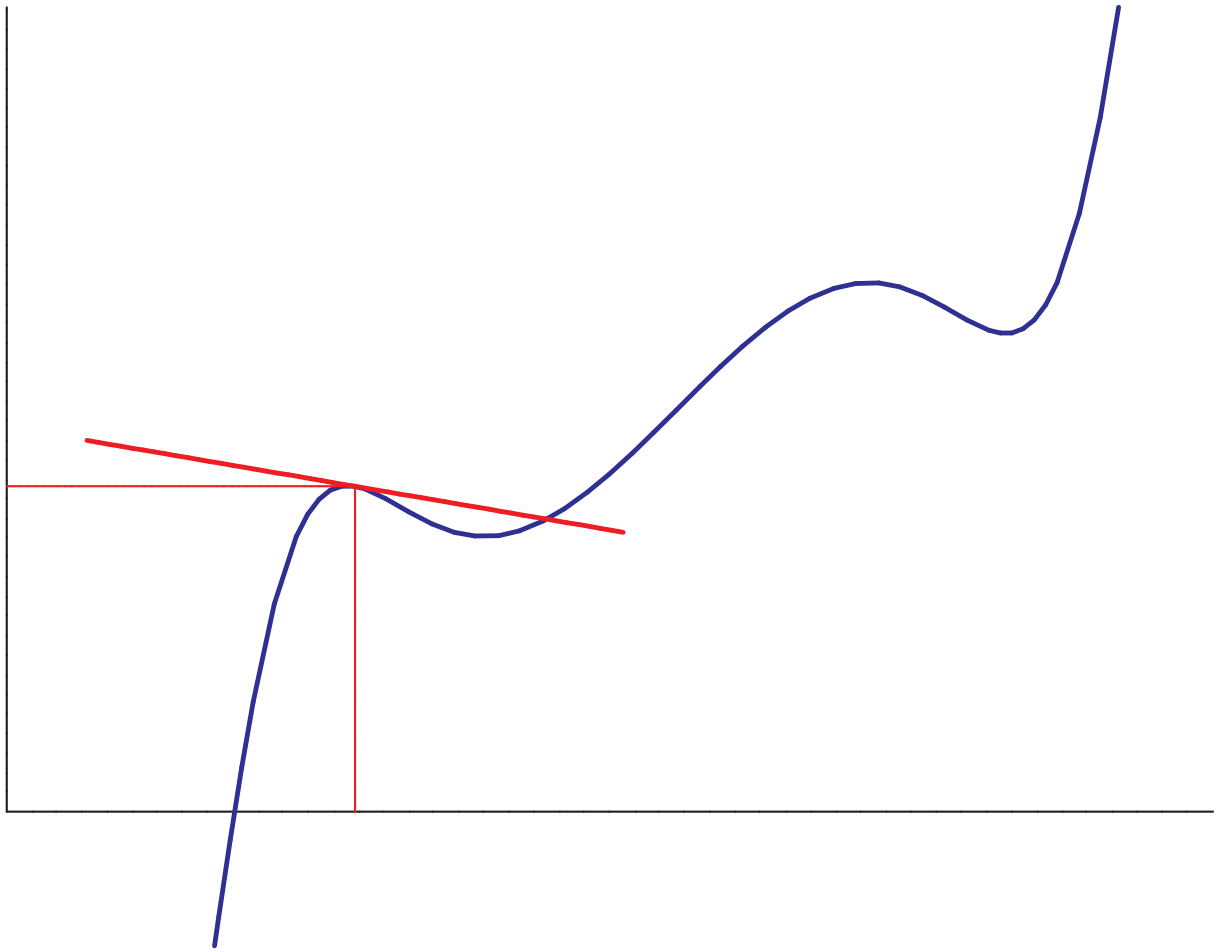
$$x \in I, x > b$$

$$\Rightarrow \frac{f(b)-f(c)}{b-c} \leq \frac{f(x)-f(b)}{x-b}$$

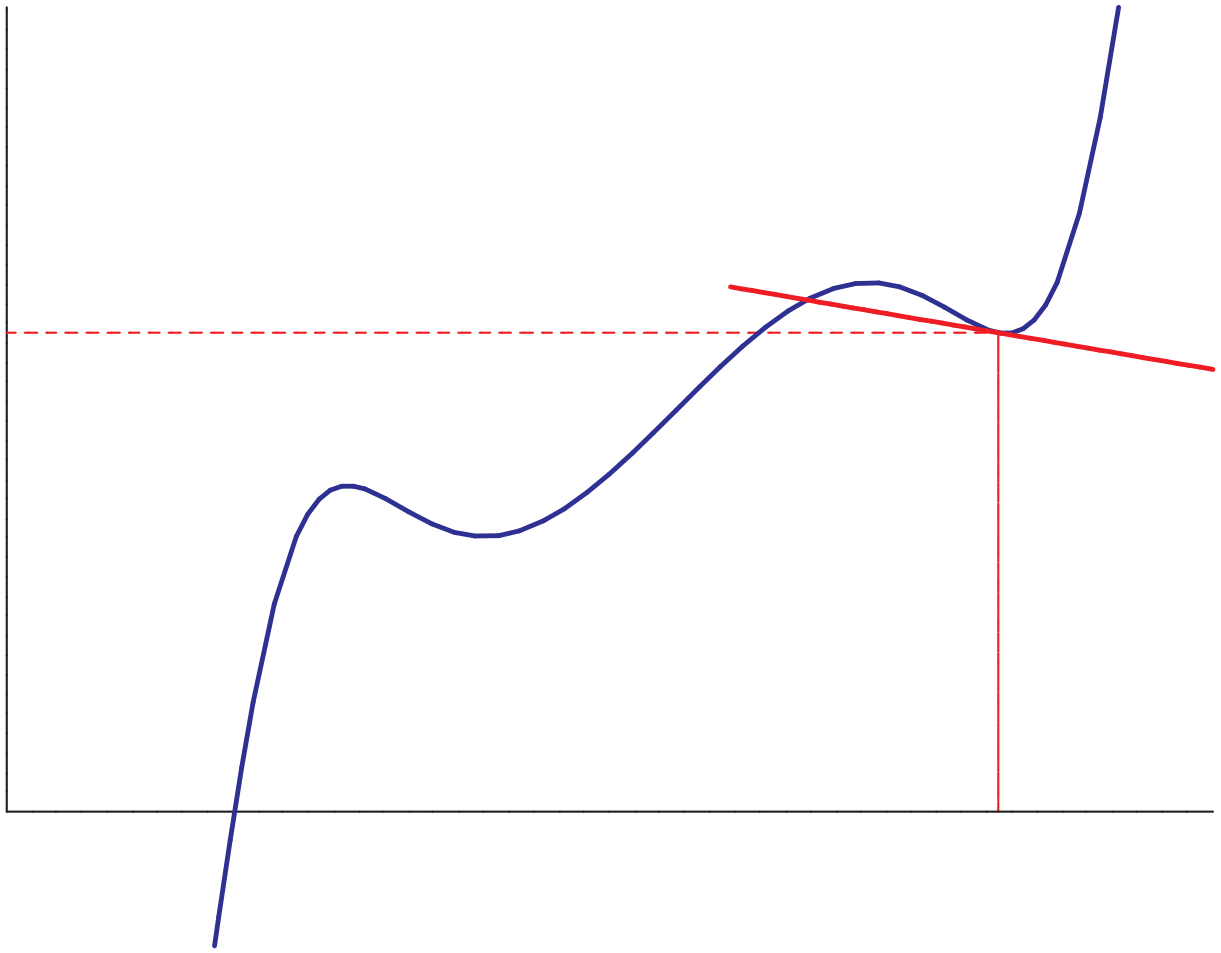
Poloha vzhledem k tečně, inflexní body



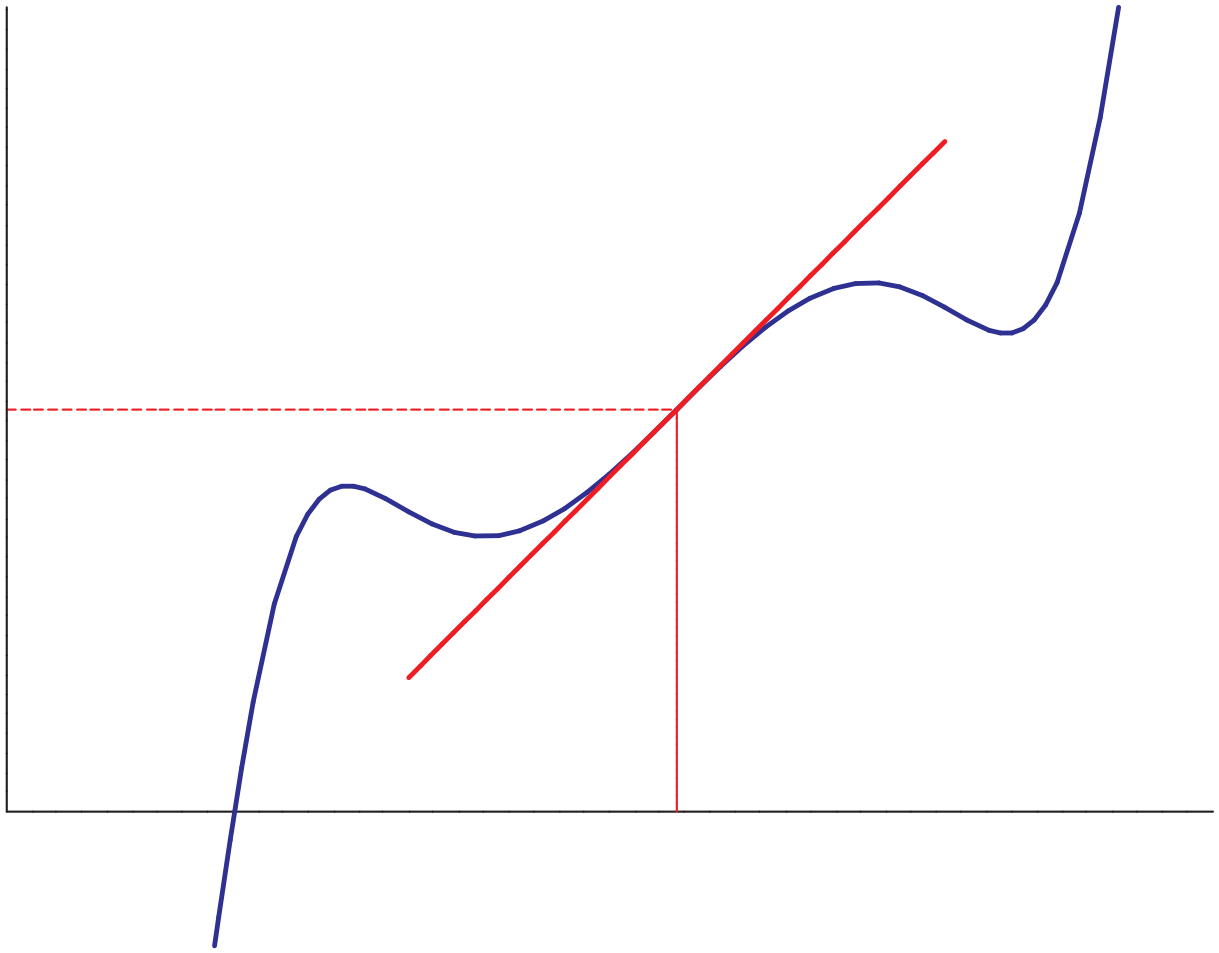
Poloha vzhledem k tečně, inflexní body



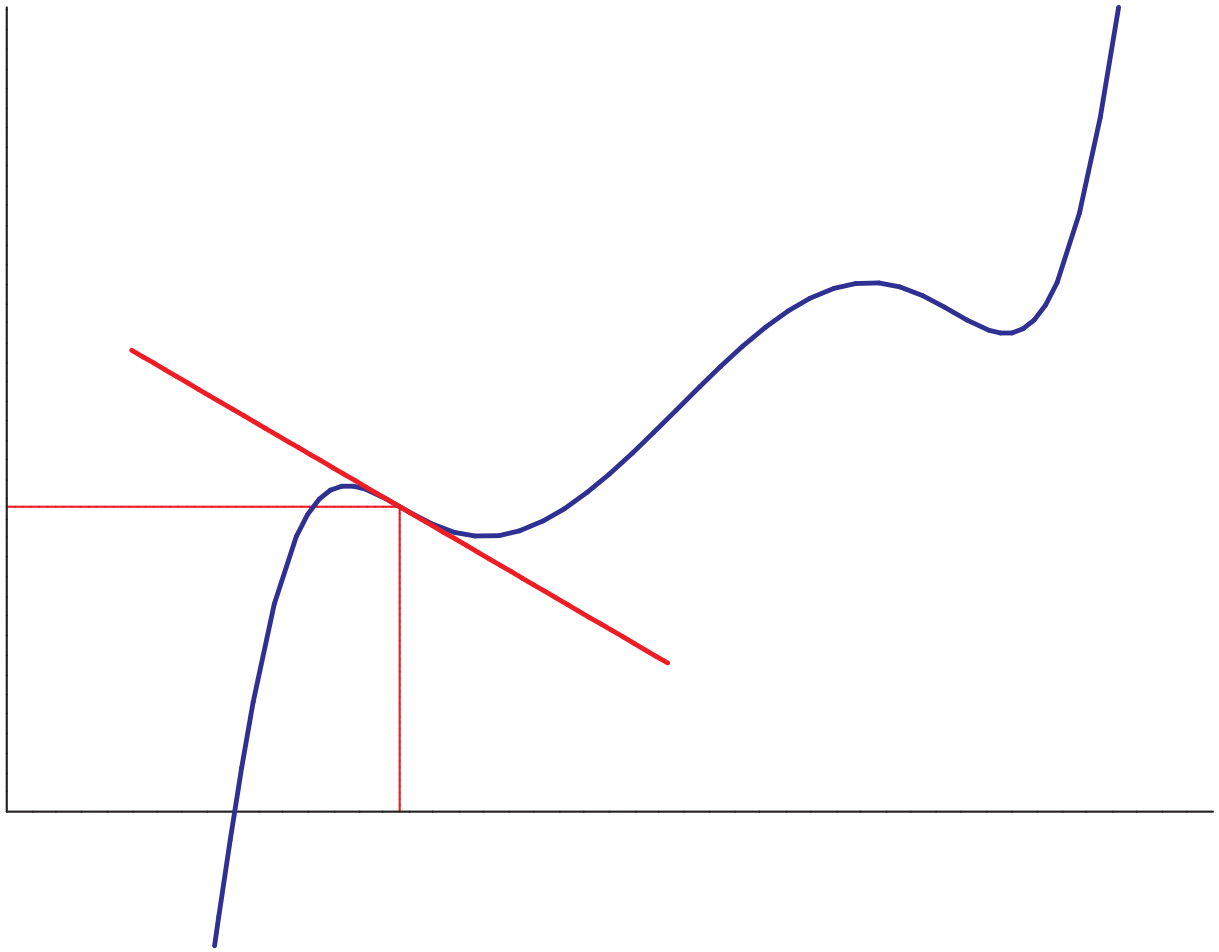
Poloha vzhledem k tečně, inflexní body



Poloha vzhledem k tečně, inflexní body



Poloha vzhledem k tečně, inflexní body



Poloha vzhledem k tečně, inflexní body