

POJAM GREŠKE . PRIBLIŽNA VREDNOST F-JE:

DRAGANA

X - TAČNA VREDNOST NEKOG BROJA

X^* - PRIBLIŽNA VREDNOST BROJA

$X - X^*$ - RAZLIKA TAČNE I PRIBLIŽNE VREDNOSTI NEKOG BROJA (MOŽE BITI $+$ I $-$)

$|X - X^*|$ - ABSOLUTNA GREŠKA (POSITIVNA VREDNOST)

$|X - X^*| \leq \Delta X^*$ - GORNJA GRANICA ABSOLUTNE GREŠKE

$\frac{|X - X^*|}{|X^*|} < \delta X^*$ - GORNJA GRANICA RELATIVNE GREŠKE

X_1, X_1^*, X_2, X_2^*

I S - ZBIR

S^* - ZBIR PRIBLIŽNIH VREDNOSTI

$$S = X_1 + X_2$$

$$S^* = X_1^* + X_2^*$$

$\Delta X_1^*, \Delta X_2^*$

$$|S - S^*| \leq \Delta X_1^* + \Delta X_2^*$$

II D - RAZLIKA

$$D = X_2 - X_1$$

$$D^* = X_2^* - X_1^*$$

$$|D - D^*| \leq \Delta X_2^* + \Delta X_1^*$$

III P - PROIZVOD

$$P = X_1 \cdot X_2$$

$$P^* = X_1^* \cdot X_2^*$$

$$|P - P^*| \leq |X_1^*| \Delta X_2^* + |X_2^*| \Delta X_1^*$$

IV Q - KOLIČNIK

$$Q = \frac{X_1}{X_2}$$

$$Q^* = \frac{X_1^*}{X_2^*}$$

$$|Q - Q^*| \leq \frac{|X_1^*| \Delta X_2^* + |X_2^*| \Delta X_1^*}{|X_2^*|^2}$$

$f(x, y)$ - FUNKČNĚ PROMĚNNÝ

$f(x^*, y^*)$ - VĚDNOST FUNKČNĚ U PŘÍBLIŽNÉHO BODU

$$f(x, y) = f(x^*, y^*) + \frac{\partial f(x^*, y^*)}{\partial x} |x - x^*| + \frac{\partial f(x^*, y^*)}{\partial y} |y - y^*| + \dots$$

$$\|f(x, y) - f(x^*, y^*)\| \leq \left| \frac{\partial f^*}{\partial x} \right| \Delta x + \left| \frac{\partial f^*}{\partial y} \right| \Delta y$$

↑
* TAYLOROVA FORMULA

Ande gaminu problema qvessu ruzsine lotie, ano se zoluzeciu
1,65 lotos i ano de $\pi \approx 3,142$.

$$V = 4R^2\pi$$

$$V(R, \pi) = 4R^2\pi$$

$$|V - V^*| = ?$$

$$R^* = 1,65$$

$$hR^* = 0,005$$

$$\pi^* = 3,142$$

$$h\pi^* = 0,0005$$

$$\frac{\partial V}{\partial R} = 8R\pi$$

$$\frac{\partial V}{\partial \pi} = 4R^2$$

$$|V - V^*| \leq \frac{\partial V}{\partial R} \cdot 0,005 + \frac{\partial V}{\partial \pi} \cdot 0,0005$$

$$|V - V^*| \leq 8R^*\pi^* \cdot 0,005 + 4R^{*2} \cdot 0,0005$$

$$|V - V^*| \leq 8 \cdot 1,65 \cdot 3,142 \cdot 0,005 + 4 \cdot 1,65^2 \cdot 0,0005$$

$$|V - V^*| \leq 0,213$$

ZA KLR:

$$f(x, y) = x^2 - xy + y^2$$

$$x = 1,65 \pm 0,05$$

$$y = 2,34 \pm 0,05$$

$$f(x, y) - f(x^*, y^*)$$

$$x^* = 1,65$$

$$y^* = 2,34$$

$$\Delta x^* = 0,05$$

$$\Delta y^* = 0,05$$

$$\frac{\partial f}{\partial x} = 2x - y$$

$$\frac{\partial f}{\partial y} = -x + 2y$$

$$f(x, y) = f(x^*, y^*) + \frac{\partial f(x^*, y^*)}{\partial x} |x - x^*| + \frac{\partial f(x^*, y^*)}{\partial y} |y - y^*|$$

$$f(x, y) - f(x^*, y^*) \leq (2x^* - y^*) |x - x^*| + (-x^* + 2y^*) |y - y^*|$$

$$f(x, y) - f(x^*, y^*) \leq (2 \cdot 1,65 - 2,34) \cdot 0,05 + (-1,65 + 2 \cdot 2,34) \cdot 0,05$$

$$f(x, y) - f(x^*, y^*) \leq 0,1395$$