Lecture 16

16-1

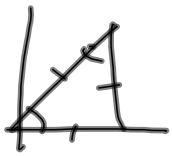
HW2 #1 $\theta = 10.0184^\circ$

$\lambda = 2.0028$

$c = 1.9956$

$d = 4.0216$

finish obs. only example



$A, f, W \Rightarrow Q = W^{-1}, Q_e = AQA^T, W_e = Q_e^{-1}$

$k = W_e f$

$V = QA^T k, \quad V = QA^T W_e f$

update $l^\circ = l + v$ ← $l^\circ_{prev} = l^\circ$

$\Delta l = l^\circ - l^\circ_{prev}$ (convergence testing)

$$\begin{bmatrix} -.0074 \\ -.0075 \\ 0.1 \\ 0 \\ 0 \end{bmatrix}, \quad \overset{1e-05}{\begin{bmatrix} -.6 \\ .5 \\ .8 \\ -.0018 \\ .0018 \end{bmatrix}}, \quad \overset{1e-07}{\begin{bmatrix} \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \end{bmatrix}}, \quad \overset{1e-14}{\begin{bmatrix} \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \end{bmatrix}}$$

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Computing Derivatives

16-2

1. analytical
2. numerical approximation
3. symbolic processing

$f(x), \quad \frac{df}{dx} = \lim_{\Delta x \to 0} \frac{f(x+\Delta x) - f(x)}{\Delta x}$

$\frac{df}{dx} \approx \frac{f(x+\Delta x) - f(x)}{\Delta x}$ Δx small number

$f(x_1, x_2, \ldots, x_n) \quad \frac{\partial f}{\partial x_i} = \frac{f(x_1, x_2, \ldots, x_i + \Delta x_i, \ldots, x_n) - f(x_1, x_2, \ldots, x_n)}{\Delta x_i}$

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