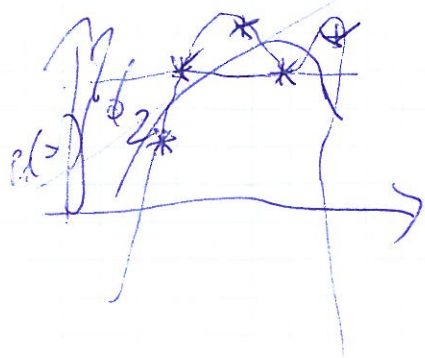




$$p_1(x) = c_1 = \frac{1}{5} \leq d; \quad ! \text{ robust, unless}$$

$$p_2(x) = \cancel{k}x + \cancel{b} \quad ! \text{ sensitive to choice of points}$$

$$! p_3(x) \text{ quatr.} \quad \text{OK}$$

$$p_5(x) \dots \text{perfect data fit!}$$

! Mathematical description

$$p_{\vec{a}}(z) = a_0 + a_1 z + \dots + a_n z^n, \quad n \text{ appropriate (math terminology)}$$

$$z \in \mathbb{Q} \cup \mathbb{P} = \{z \mid |z| = 1\}$$

$$\begin{aligned} p(e^{it}) &= a_0 + a_1 e^{it} + a_2 e^{i2t} \dots \\ &= a_0 + a_1 (\cos t + i \sin t) + a_2 (\cos 2t + i \sin 2t) \dots \end{aligned}$$

i.e. trigonometric polynomials!

~~Start~~ how to build the linear equation:

① Choose the degree of the polynomial

$$\Rightarrow \vec{a} = (a_0, \dots, a_n) \text{ unknown!}$$

$$\text{or " Ansatz " } p(z) = \sum_{k=0}^n a_k z^k$$

② Equations:

$$p(z_{tr}) = d_n \in \mathbb{C}, \quad 300 \text{ equations}$$

$$\text{or } 300 \times (n+1) \text{-Matrix (Vektormatrix)} A * \vec{a} = \vec{d}$$