

# 微分方程数值解法

## 第十五周作业

桑明达 15300180062

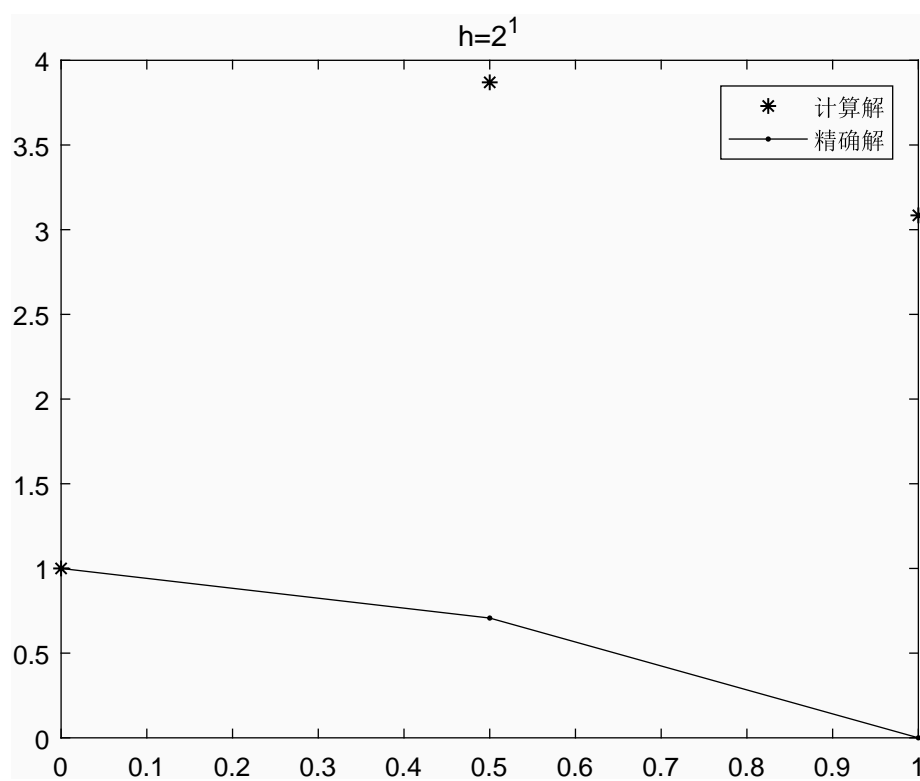
2018 年 6 月 27 日

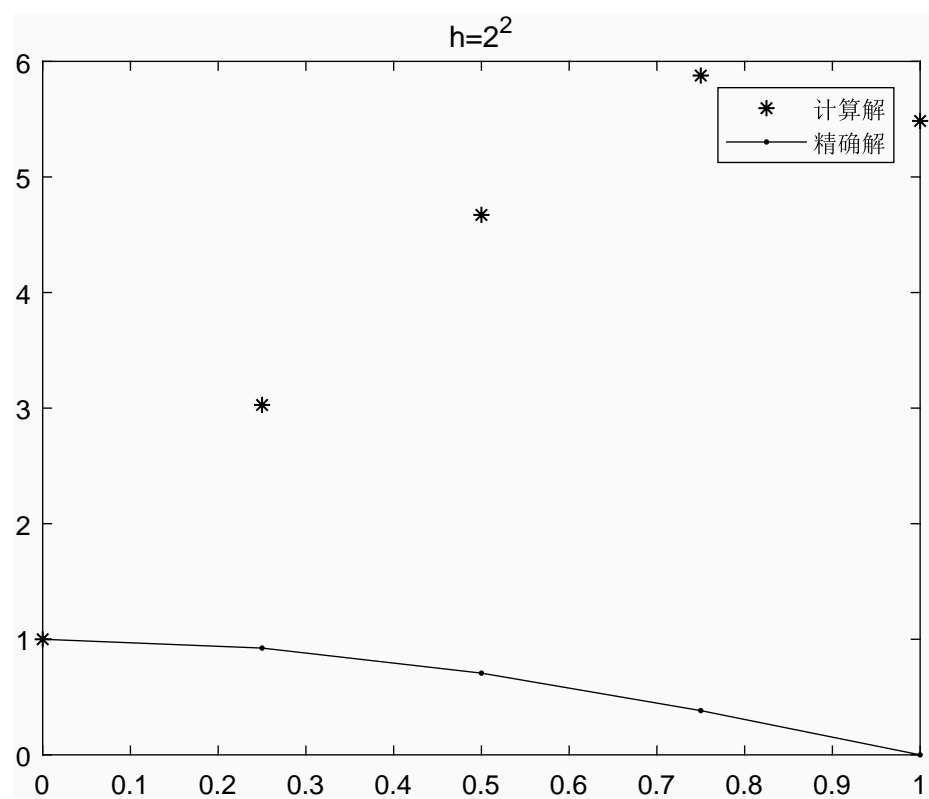
### 1 P254 3 用线性有限元求解混合边值问题

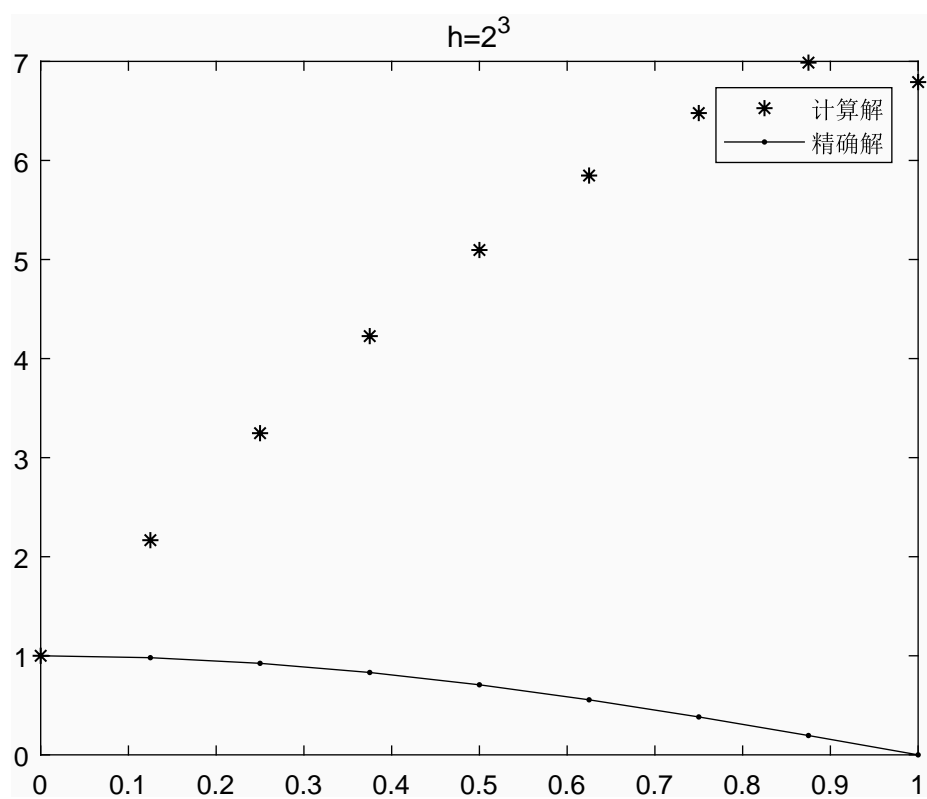
证明. 我使用下面的  $\mathbf{L}$ 、 $\mathbf{F}$ , 计算结果如后图, 偏差比较大, 求正确求解方式

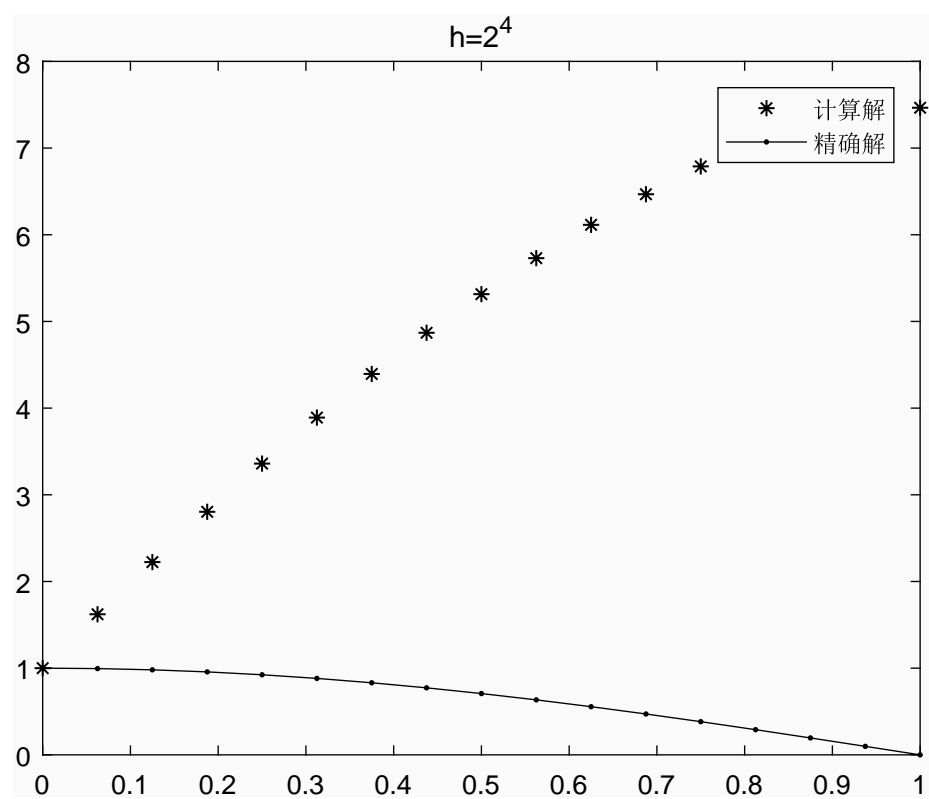
$$\mathbf{L} = \begin{pmatrix} a(\varphi_1, \varphi_1) & a(\varphi_1, \varphi_2) & & & \\ a(\varphi_2, \varphi_1) & a(\varphi_2, \varphi_2) & a(\varphi_2, \varphi_3) & & \\ & a(\varphi_3, \varphi_2) & a(\varphi_3, \varphi_3) & \ddots & \\ & & \ddots & \ddots & a(\varphi_{n-2}, \varphi_{n-1}) \\ & & & a(\varphi_{n-1}, \varphi_{n-2}) & a(\varphi_{n-1}, \varphi_{n-1}) + a(\varphi_{n-1}, \varphi_n) \end{pmatrix}$$

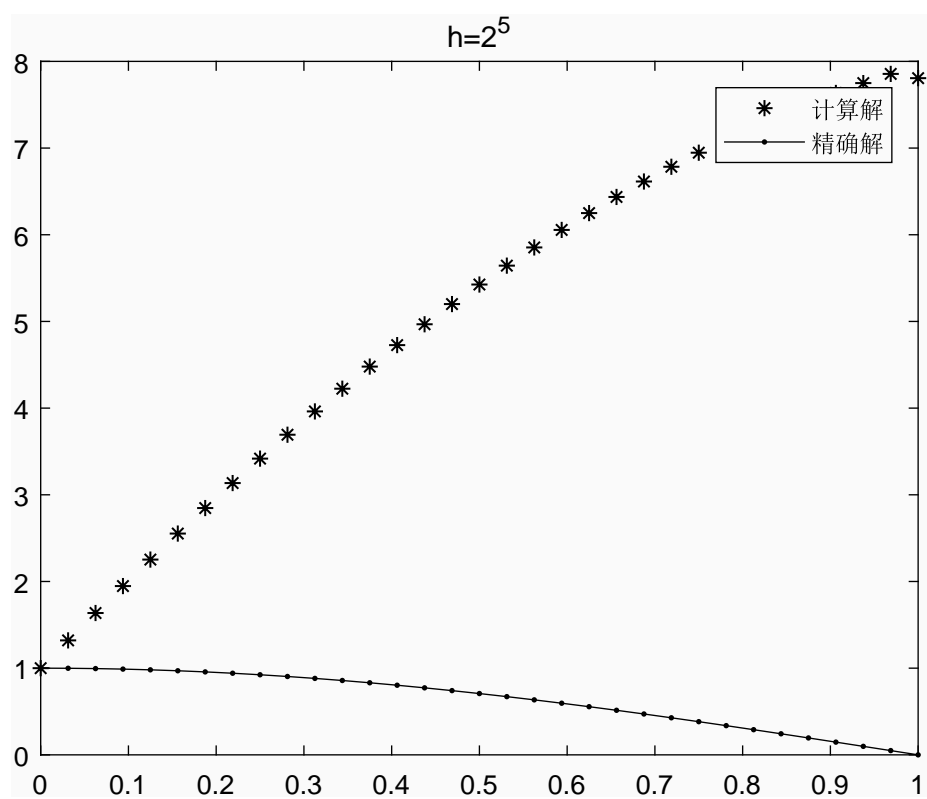
$$\mathbf{F} = \begin{pmatrix} \langle f, \varphi_1 \rangle - u(0)a(\varphi_1, \varphi_0) \\ \langle f, \varphi_2 \rangle \\ \langle f, \varphi_3 \rangle \\ \vdots \\ \langle f, \varphi_{n-2} \rangle \\ \langle f, \varphi_{n-1} \rangle - hu'(1)a(\varphi_n, \varphi_{n-1}) \end{pmatrix}$$

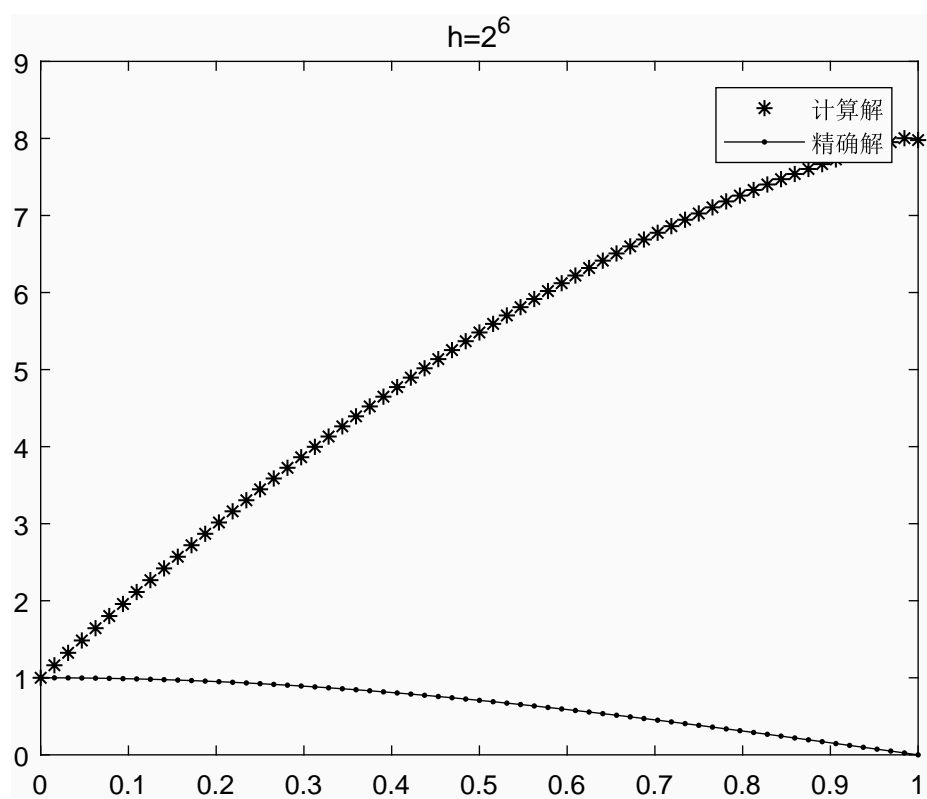












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