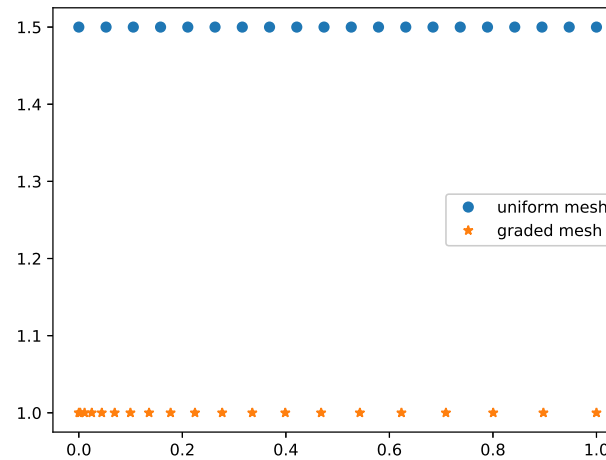
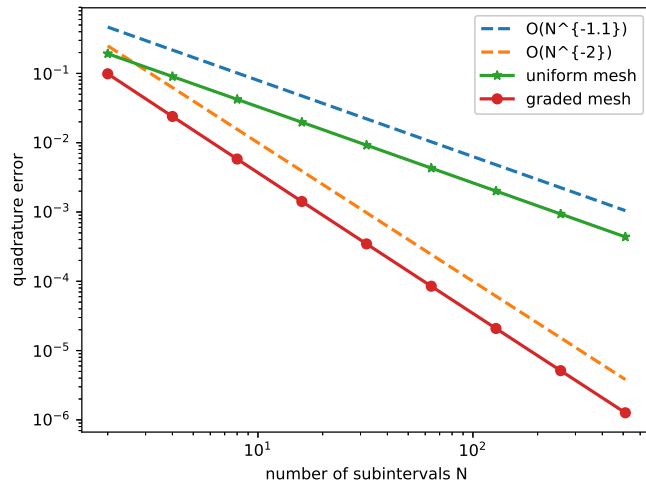


# locally refined meshes



To approximate  $\int_0^1 x^{0.1} dx$  the composite trapezoidal rule with two different meshes is used:

1. **uniform** mesh with  $x_i = i/N$ ,  $i = 0, \dots, N$
2. **adapted** mesh with  $x_i = (i/N)^\beta$ ,  $i = 0, \dots, N$ ,  $\beta = 2$

observation:

- since the integrand is not smooth, the uniform mesh yields a **reduced** convergence  $O(N^{-1.1})$
- adapted mesh yields the optimal convergence  $O(N^{-2})$