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$$3 \quad x_i = \frac{-1+i}{2} + \frac{1+i}{2} \cos \frac{(2i-1)\pi}{2n} = \cos \frac{(2i-1)\pi}{2n}$$

$$\therefore x_1 = \cos \frac{\pi}{10} \quad x_2 = \cos \frac{3\pi}{10} \quad x_3 = \cos \frac{5\pi}{10} \quad x_4 = \cos \frac{7\pi}{10} \quad x_5 = \cos \frac{9\pi}{10}$$

计算插值多项式得 $Q_5(x) = 1 + 0.997317x + 0.499556x^2 + 0.177335x^3 + 0.0434341x^4$

$$|e^x - Q_5(x)| \leq \frac{|(x-x_1)(x-x_2)(x-x_3)(x-x_4)(x-x_5)|}{5!} e = \frac{e}{5! 2^4} = 0.00141577$$

可以精确到小数点后两位.



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$$4. \quad x_i = \frac{1.26}{2} + \frac{1.26}{2} \cos \frac{(2i-1)\pi}{2n} = 0.8 + 0.2 \cos \frac{(2i-1)\pi}{2n}$$

$$x_1 = 0.8 + 0.2 \cos \frac{\pi}{10} \quad x_2 = 0.8 + 0.2 \cos \frac{3\pi}{10} \quad x_3 = 0.8 + 0.2 \cos \frac{5\pi}{10}$$

$$x_4 = 0.8 + 0.2 \cos \frac{7\pi}{10} \quad x_5 = 0.8 + 0.2 \cos \frac{9\pi}{10}$$

計算插值多項式得 $Q_4(x) = 1.00495 + 0.96827x + 0.577005x^2 + 0.074618x^3 + 0.0928855x^4$

$$|e^x - Q_4(x)| \leq \frac{|(x-x_1)(x-x_2)(x-x_3)(x-x_4)(x-x_5)|}{5!} e = \frac{0.2^5 e}{5! \cdot 2^4} = 4.53047 \times 10^{-7}$$

可以精確到小數點後6位。