

11. 解: 由已知, 得

$$\int_{-1}^1 e^x \sin x dx = \int_{-1}^1 e^{x+2} \sin(x+2) d(x+2)$$

$$= \int_{-1}^1 e^{x+2} \sin(x+2) dx$$

$$\text{即 } f(x) = e^{x+2} \sin(x+2)$$

$$n=2 \text{ 时, } x = \pm 0.7745967, x = 0.0000000$$

$$A_k = 0.5555556, 0.8888889$$

则有:

$$\begin{aligned} \int_{-1}^1 e^{x+2} \sin(x+2) dx &\approx 0.5555556 f(-0.7745967) + 0.8888889 f(0) \\ &\quad + 0.5555556 f(0.7745967) \\ &= 10.9484 \end{aligned}$$

$n=3$ 时有:

$$x_k = \pm 0.8611363, \pm 0.3399810$$

$$A_k = 0.3478548, 0.6521452$$

则有:

$$\begin{aligned} \int_{-1}^1 e^{x+2} \sin(x+2) dx &\approx 0.3478548 f(-0.8611363) + 0.6521452 f(-0.3399810) \\ &\quad + 0.6521452 f(0.3399810) + 0.3478548 f(0.8611363) \\ &= 10.9501 \end{aligned}$$

$$12. \text{ 解: } \int_{-1}^1 \frac{1}{y} dy = \int_{-1}^1 \frac{1}{y+2} dy$$

则有: $n=4$, 有

$$x_k = \pm 0.9061798, \pm 0.5384693, 0.0000000$$

$$A_k = 0.2369269, 0.4786287, 0.5688889$$

$$\begin{aligned} \therefore \int_{-1}^1 \frac{1}{y+2} dy &\approx 0.2369269 [f(0.9061798) + f(-0.9061798)] \\ &\quad + 0.4786287 [f(0.5384693) + f(-0.5384693)] \\ &\quad + 0.5688889 f(0) \\ &= 1.09861 \end{aligned}$$

13. 解: 由已知得

$$D_c^{(0)}(0.2) = -0.8333$$

$$D_c^{(0)}(0.1) = -0.9091$$

$$\therefore D_c^{(1)}(0.2) = \frac{4 \times (-0.9091) - (-0.8333)}{4 - 1}$$

$$= -0.9344$$

此即更好的近似值