

## 第 4 章 習題簡答

### 習題 4-1

1. (1)  $\frac{9}{16}$  (2)  $\frac{9}{25}$  (3)  $\frac{121}{400}$  (4)  $\frac{1}{4}$  2. (1)  $\frac{291}{8}$  (2)  $\frac{717}{25}$  (3)  $\frac{5259}{200}$  (4) 24  
 3. (1)  $\frac{93}{8}$  (2)  $\frac{348}{25}$  (3)  $\frac{2901}{200}$  (4) 15 4. (1) 30 (2)  $\frac{123}{25}$  (3)  $\frac{114}{5}$  (4) 42

### 習題 4-2

1. (1)  $\int_0^1 \frac{1}{1+x^2} dx$  (2)  $\int_0^1 \frac{1}{1+x} dx$  (3)  $\int_0^4 \sqrt{x} dx$  (4)  $\int_0^1 \ln(1+x) dx$  (5)  $\int_0^1 \frac{1}{\sqrt{x}} dx$   
 2. (1)  $\frac{3}{2}$  (2) 12 (3)  $\frac{5}{6}$  (4) 0 3. (1)  $\frac{41}{6}$  (2)  $\frac{9\pi}{4}$

### 習題 4-3

1.  $2xe^{|x|}$  2.  $2x\sin(x^2+9)^3$  3.  $2e^\pi - 2$  4.  $\frac{255}{2} + 5\ln 2 - 6\cos 2 + 6\cos 1$   
 5.  $F'(x) = 2x(2x^2 - 3)$ , 相對極小值:  $F(-\sqrt{\frac{3}{2}}) = -\frac{9}{4}$ ,  $F(\sqrt{\frac{3}{2}}) = -\frac{9}{4}$ ; 相對極大值:  
 $F(0) = 0$ ; 6.  $f(x) = 4x^3 - \frac{3}{2}x^2$  7. 3 8.  $f(\frac{\pi}{4}) = \frac{\pi}{2}$ ,  $f'(\frac{\pi}{4}) = 6 - \frac{\pi^2}{4}$   
 9.  $f(x) = 1 + 2x$  10.  $f(x) = \frac{1}{4}(x-6)^4 + 4 - \frac{5^4}{4}$  11. 6

### 習題 4-4

1.  $\frac{1}{3}x^3 - x^2 + 3x + c$  2.  $-x^3 + x^2 + 5x + c$  3.  $\frac{2}{5}x^{\frac{5}{2}} - \frac{3}{2}x^2 + c$  4.  $\frac{3}{7}x^{\frac{7}{3}} - \frac{2}{3}x^3 + c$   
 5.  $\frac{2}{3}x^{\frac{3}{2}} - 2x^{\frac{1}{2}} + c$  6.  $\frac{2}{5}x^{\frac{5}{2}} - 2x^{\frac{3}{2}} + 8x^{\frac{1}{2}} + c$  7.  $\frac{1}{3}x^3 + 2x^{-1} + \frac{2}{5}x^{\frac{5}{2}} + c$   
 8.  $-\frac{2}{3}x^{-\frac{3}{2}} + \frac{1}{2}x^{-2} + c$  9.  $21x^{\frac{1}{3}} + \frac{3}{2}x^{\frac{2}{3}} + c$  10.  $2x^{\frac{1}{2}} + \frac{1}{\sqrt{2}}x + c$

### 習題 4-5

1.  $\frac{5}{6}$  2.  $\frac{7}{6}$  3. 2 4.  $\frac{28\sqrt{7}}{3}$  5.  $\frac{8}{3}$  6.  $\frac{37}{12}$  7. 18 8.  $\frac{125}{6}$  9. 72 10.  $\frac{16}{3}$   
 11.  $\frac{32}{3}$