

Homework 18 Answer Key

$$1. f'(x) = e^x + e^{-x}(-1) + e^x e^{-1} - e^{-x} e^{-1} + \frac{1}{e} + 0 - 2e^{-3} + e^{-\frac{3}{e^3}} x^{-4}$$

$$\int f(x) dx = e^x + \frac{e^{-x}}{-1} + \frac{x e^{-1}}{e^{-1}} + \frac{x^{-e+1}}{-e+1} + \frac{1}{e} \cdot \frac{x^2}{2} + e \cdot x + e \frac{x^{-1}}{-1} + e \cdot \frac{x^2}{2} + \frac{1}{e^3} \cdot \frac{x^{-2}}{-2} + C$$

$$2. f'(x) = e^{7x} \cdot 7 + \frac{1}{7} e^{-7x} (-7) + 0 + 7e^{-x}(-1) + 0 + e^{7-x}(-1) + e^{-7+x} \cdot (1) + e^{\sqrt{7-x}} \cdot \frac{1}{2\sqrt{7-x}} (-1)$$

$$3. f'(x) = e^{\tan x} \cdot \sec^2 x + e^{-\sec x} \cdot (-\sec x \tan x)$$

$$4. f'(x) = e^{-\tan x} \cdot (-\sec^2 x) + [\sec(e^x) \cdot \tan(e^x)] \cdot e^x$$

$$5. f'(x) = -\sin \sqrt{e^x + e^7} \cdot \frac{1}{2\sqrt{e^x + e^7}} \cdot e^x + e^{\sqrt{7x+7\cos x}} \cdot \frac{1}{2\sqrt{7x+7\cos x}} \cdot (7-7\sin x) + \dots$$

Continued $\dots + \frac{1}{2\sqrt{e^{7x} - \sin x}} \cdot (e^{7x} \cdot 7 - \cos x)$

$$6. f'(x) = e^{-\sqrt{7x+\sin x}} \cdot \frac{-1}{2\sqrt{7x+\sin x}} \cdot (7+\cos x) - \frac{1}{2} (e^{7x} - \sin x)^{-3/2} (e^{7x} \cdot 7 - \cos x)$$

$$7. -\frac{2}{e^{1+\sqrt{x}}} + C$$

$$8. \frac{e^{-3x}}{-3} + 2x + \frac{e^{3x}}{3} + C$$

$$9. -\frac{1}{3(1+e^{3x})} + C$$

$$10. \frac{1}{15(1+e^{-3x})^5} + C$$

$$11. \frac{(1+e^{3x})^7}{21} + C$$

$$12. \frac{e^{3x}}{3} - \frac{1}{e^x} - \frac{1}{2e^{2x}} - \frac{1}{6e^{6x}} + C$$

$$13. f(x) = 3e^x - 5\sin x + 4x - 2$$

14. 0

20. 10

15. 1

21. $\frac{7 - \ln 6}{4}$

16. 5

17. 6

22. $\frac{e^2 + 10}{3}$

18. 36

19. $\frac{1}{16}$