

Integrals using techniques up to Section 1.7  
**Answer Key**

1.  $\frac{1}{4}(\tan^{-1}(2t))^2$

2.  $\sqrt{2} - 1$

3.  $\sqrt{e^{\tan x} + C}$  .

4.  $-\frac{\pi}{12}$

5.  $-\frac{\cos^4 \theta}{4} + C$

6.  $-\frac{1}{4}\cos^2(t^2) + C$

7.  $-\frac{1}{\ln x} + C$

8.  $\frac{1}{3}\ln\left(\frac{26}{7}\right)$

9.  $-\frac{1}{2}(\ln(\cos(x)))^2 + C$

10.  $\frac{62}{15}$

11. 1

12.  $\frac{1}{3}(2\sqrt{2} - 1)$

$$13. -\frac{2(y^3-2)}{3\sqrt{1-y^3}}$$

$$14. t + C$$

$$15. -\frac{\cos^3(\pi t)}{3\pi} + C$$

$$16. 3x - \frac{2}{x} + C$$

$$17. \frac{1}{2} \ln\left(\frac{4}{3}\right)$$

$$18. \sqrt{2} - 1$$

$$19. 14x - \frac{2}{x} - \frac{1}{2x^2} + C$$

$$20. -\frac{1}{3} \ln|\sin(3x) + \cos(3x)| + C$$

$$21. \frac{(1-x)^{101}}{101} - \frac{(1-x)^{100}}{100} + C$$

$$22. \frac{-1}{3} e^{-3x} + C$$

$$23. 1$$

$$24. \frac{1}{3} \tan^{-1}\left(\frac{x}{3}\right) + C$$

$$25. \frac{1}{33} (1 - \cos^3\theta)^{11} + C$$

$$26. \frac{1}{2} \ln \frac{3}{2}$$

$$27. -\frac{1}{22(11x-7)^2} + C$$

$$28. \sin^{-1}(e^t) + C$$

29.  $\sin^{-1}\left(\frac{x}{3}\right) + C$

30.  $9 - \frac{1}{2}$

31.  $\frac{8}{3}x^{3/2} + \frac{4}{5}x^{5/4} + C$

32.  $-\frac{3^{-x}}{\ln 3} + C$

33.  $\frac{\pi}{3}$

34.  $\ln(\sqrt{3} - 1)$

35.  $\frac{1}{2}(\sin^{-1}t)^2 + C$

36.  $\ln(x \cos x) + C$

37.  $\ln(\ln(\ln x)) + C$

38.  $1 - \frac{2}{\sqrt{5}}$