

1. $\int e^x(3 - 4e^x) dx$
 2. $\int \frac{5\sqrt{x}}{\sqrt{x}} dx$
 3. $\int \frac{e^{-x}}{\sqrt{1 - e^{-x}}} dx$
 4. $\int \frac{1}{x^2 - 6x + 9} dx$
 5. $\int \frac{1}{\sqrt{x}} \sin \sqrt{x} dx$
 6. $\int \sin^2 3\theta \cos 3\theta d\theta$
 7. $\int \sec^2 x \sqrt{\tan x} dx$
 8. $\int (x - 2)\sqrt{x + 1} dx$
 9. $\int \left(\frac{3}{x^2} + \frac{4}{x^4}\right) dx$
 10. $\int e^{\ln \sqrt{x}} dx$
 11. $\int \ln e^{x^3} dx$
 12. $\int \frac{y + 3}{(3 - y)^{2/3}} dy$
 13. $\int 8^{5x-1} dx$
 14. $\int e^{2 \ln x} dx$
 15. $\int \left(\frac{t^3}{3} + \frac{1}{4t^2}\right) dt$
 16. $\int \sqrt{3 + x} (x + 1)^2 dx$
 17. $\int \frac{x^3}{\sqrt{1 - 2x^2}} dx$
 18. $\int p^2 \sec^2 p^3 dp$
 19. $\frac{dy}{dx} = \frac{\sqrt{x} + x}{\sqrt{y} - y}$
 20. $\frac{dy}{dx} = \frac{x^2 \sqrt{x^3 - 3}}{y^2}$
 21. $\frac{dy}{dx} = \frac{\cos 3x}{\sin 2y}$ where $y = \frac{\pi}{3}$ when $x = \frac{\pi}{2}$
 22. $y \frac{dy}{dx} - e^x = 0$ where $y(0) = 4$
 23. $\frac{du}{dv} = uv \sin v^2$ where $u(0) = 1$
 24. $(2 + x)y' = 3y$
 25. $y \ln x - xy' = 0$
26. A stone is thrown downward at 96 feet per second from a cliff 112 feet high. How long will it take the stone to reach the ground? What will the velocity at impact be?
 27. A projectile is launched upward from the top of a 150-meter tower at 49 meters per second. Find the maximum height the projectile reaches.
 28. A man drops a stone from a bridge over a river. How high is the bridge if the stone takes 4 seconds to hit the water?
 29. A helicopter pilot drops a package from his helicopter when the helicopter is 200 feet high and moving vertically at 20 feet per second. How long will it take the package to hit the ground? What will the velocity be at when it hits the ground?

1. $3e^x - 2e^{2x} + C$
2. $\frac{2 \cdot 5^{\sqrt{x}}}{\ln 5} + C$
3. $2\sqrt{1 - e^{-x}} + C$
4. $-\frac{1}{x-3} + C$
5. $-2 \cos \sqrt{x} + C$
6. $\frac{1}{9} \sin^3 3\theta + C$
7. $\frac{2}{3} \sqrt{\tan^3 x} + C$
8. $\frac{2}{5} \sqrt{(x+1)^5} - 2\sqrt{(x+1)^3} + C$
9. $-\frac{3}{x} - \frac{4}{3x^3} + C$
10. $\frac{2\sqrt{x^3}}{3} + C$
11. $\frac{1}{4}x^4 + C$
12. $-18\sqrt[3]{3-y} + \frac{3}{4}\sqrt[3]{(3-y)^4} + C$
13. $\frac{8^{5x-1}}{5 \ln 8} + C$
14. $\frac{1}{3}x^3 + C$
15. $\frac{1}{12}t^4 - \frac{1}{4t} + C$
16. $\frac{2}{7}\sqrt{(3+x)^7} - \frac{8}{5}\sqrt{(3+x)^5} + \frac{8}{3}\sqrt{(3+x)^3} + C$
17. $-\frac{1}{4}\sqrt{1-2x^2} + \frac{1}{12}\sqrt{(1-2x^2)^3}$
18. $\frac{1}{3} \tan p^3 + C$
19. $4\sqrt{y^3} + 3y^2 = 4\sqrt{x^3} + 3x^2 + D$
20. $\frac{1}{3}y^3 = \frac{2}{9}\sqrt{(x^3-3)^3} + C$
21. $-6 \cos 2y = 4 \sin 3x + 7$
22. $y^2 = 2e^x + 14$
23. $u = e^{(1/2) \cos v^2 + (1/2)}$ That's u raised to $(1/2) \cos v^2 + (1/2)$
24. $y = Ae^{3 \ln |x+2|}$
25. $y = Ae^{(1/2) \ln^2 x}$
26. 1 second and -128 feet per second
27. 272.5 meters
28. 256 feet
29. 4.215 seconds and -114.891 feet per second