In the following exercises, find the integral.

15. $\int (x+3)dx$

18. $\int (4x^3 + 6x^2 - 1)dx$

20. $\int (x^3 - 4x + 2)dx$

21. $\int \left(x^{3/2} + 2x + 1 \right)dx$

23. $\int \sqrt[3]{x^2}\, dx$

26. $\int \dfrac{1}{x^4}\, dx$

27. $\int \dfrac{x^2 + x + 1}{\sqrt{x}}\, dx$

28. $\int \dfrac{x^2 + 2x - 3}{x^4}\, dx$

31. $\int y^2 \sqrt{y}\, dy$

34. $\int 3dt$

35. $\int (2\sin x + 3\cos x)dx$

40. $\int \sec y(\tan y - \sec y)dy$

41. $\int (\tan^2 y + 1)dy$

In the following exercises, solve the differential equation.

55. $f'(x) = 4x,\ f(0) = 6$

58. $f'(s) = 6s - 8s^3,\ f(2) = 3$

59. $f''(x) = 2,\ f'(2) = 5,\ f(2) = 10$

60. $f''(x) = x^2,\ f'(0) = 6,\ f(0) = 3$

62. $f''(x) = \sin x,\ f'(0) = 1,\ f(0) = 6$

In 67, use a(t)=-32 feet per second per second as the acceleration due to gravity.

67. A ball is thrown vertically upward from a height of 6 feet with an initial velocity of 60 feet per second. How high will the ball go?

In 73, use a(t)=-9.8 meters per second per second as the acceleration due to gravity.

73. A baseball is thrown upward from a height of 2 meters with an initial velocity of 10 meters per second. Determine its maximum height.