

38. Let $u = 4 + 3x$, so $du = 3 dx$.

$$\int \sqrt{4+3x} dx = \int \sqrt{u} \left(\frac{1}{3} du\right) = \frac{1}{3} \left[\frac{u^{3/2}}{3/2} \right]$$

39. Let $u = 1 + 2x^3$, so $du = 6x^2 dx$.

$$\int x^2(1+2x^3)^5 dx = \int u^5 \left(\frac{1}{6} du\right) = \frac{1}{6} \left[\frac{1}{6} u^6 \right]$$

40. Let $u = \sin x$, so $du = \cos x dx$.

$$\int e^{\sin x} \cos x dx = \int e^u du = [e^u]$$

42. Let $u = 4t$, so $du = 4 dt$.

$$\int \sin 4t dt = \int \sin u \left(\frac{1}{4} du\right) = -\frac{1}{4} [\cos u]$$

43. Let $u = \sqrt{x}$, so $du = \frac{1}{2\sqrt{x}} dx$.

$$\int \frac{e^{\sqrt{x}}}{\sqrt{x}} dx = \int e^u (2 du) = 2 [e^u]$$

44. Let $u = 3x + 1$, so $du = 3 dx$.

$$\int \frac{dx}{3x+1} = \int \frac{1}{u} \left(\frac{1}{3} du\right) = \frac{1}{3} [\ln |u|]$$

47. Let $u = 1 + 2x$, so $du = 2 dx$.

$$\int \frac{dx}{\sqrt[3]{(1+2x)^2}} = \int u^{-2/3} \left(\frac{1}{2} du\right) = \left[\frac{1}{2} \cdot 3u^{1/3} \right]$$

51. Let $u = \ln x$, so $du = \frac{dx}{x}$.

$$\int \frac{dx}{x\sqrt{\ln x}} = \int u^{-1/2} du = 2 [u^{1/2}]$$

52. Let $u = \sin^{-1} x$, so $du = \frac{dx}{\sqrt{1-x^2}}$.

$$\int \frac{\sin^{-1} x}{\sqrt{1-x^2}} dx = \int u du = \left[\frac{u^2}{2} \right]$$