

$$13. \int \frac{dx}{5-3x}$$

$$u = 5-3x$$

$$du = -3dx$$

$$\frac{du}{-3} = dx$$

$$\ln a^b = b \cdot \ln a$$

$$= -\frac{1}{3} \int \frac{du}{u}$$

$$= -\frac{1}{3} \ln |u| + C = -\frac{1}{3} \ln |5-3x| + C$$

$$= \ln \left| (5-3x)^{-\frac{1}{3}} \right| + C$$

$$= \ln \left| \frac{1}{\sqrt[3]{5-3x}} \right| + C_1$$

$$= \ln \left| \frac{1}{\sqrt[3]{5-3x}} \right| + \ln C_2$$

$$= \ln \left| C_2 \left( \frac{1}{\sqrt[3]{5-3x}} \right) \right|$$

$$\text{II. } \int (x+1)\sqrt{2x+x^2} dx$$

$$= \frac{1}{2} \int \sqrt{u} du$$

$$= \frac{1}{2} \cdot \frac{2}{3} u^{\frac{3}{2}} + C$$

$$= \frac{1}{3} (2x+x^2)^{\frac{3}{2}} + C$$

$$u = 2x + x^2$$

$$du = (2 + 2x) dx$$

$$\frac{du}{2} = (1+x) dx$$

$$17. \int \frac{a + bx^2}{\sqrt{3ax + bx^3}} dx$$

$$u = 3ax + bx^3$$

$$du = (3a + 3bx^2) dx$$

$$\frac{du}{3} = (a + bx^2) dx$$

$$= \frac{1}{3} \int \frac{du}{\sqrt{u}} = \frac{1}{3} (2u^{\frac{1}{2}}) + C$$

$$= \frac{2}{3} \sqrt{3ax + bx^3} + C$$

$$7. \int x \sin(x^2) dx$$

$$= \frac{1}{2} \int \sin(u) du$$

$$= -\frac{1}{2} \cos(u) + C$$

$$= -\frac{1}{2} \cos(x^2) + C$$

$$u = x^2$$
$$du = 2x dx$$

$$\frac{du}{2} = x dx$$