

$$\text{And } \int \frac{dx}{\sqrt{2ax+x^2}} = \log \{x+a+\sqrt{2ax+x^2}\},$$

$$\begin{aligned} \therefore \int \frac{x dx}{\sqrt{2ax+x^2}} \\ = \sqrt{2ax+x^2} - a \log \{x+a+\sqrt{2ax+x^2}\}. \end{aligned}$$

$$\begin{aligned} \therefore \int \frac{x^2 dx}{\sqrt{2ax+x^2}} &= \frac{x\sqrt{2ax+x^2}}{2} - \frac{3a}{2} \sqrt{2ax+x^2} \\ &+ \frac{3a^2}{2} \log \{x+a+\sqrt{2ax+x^2}\}. \end{aligned}$$

$$(3.) \quad \int_a^0 \frac{x^2 dx}{(2ax-x^2)^{\frac{3}{2}}}$$

$$\text{let } p = x \quad dp = dx, \quad dq = \frac{x dx}{(2ax-x^2)^{\frac{3}{2}}},$$

$$\therefore q = \int \frac{x dx}{(2ax-x^2)^{\frac{3}{2}}} = \int (2a-x)^{-\frac{3}{2}} x^{\frac{1}{2}} dx =$$

$$\int (2ax^{-1}-1)^{-\frac{3}{2}} x^{-2} dx$$

$$= -\frac{1}{2a} \int (2ax^{-1}-1)^{-\frac{3}{2}} \times -2ax^{-2} dx$$

$$= \frac{(2ax^{-1}-1)^{-\frac{1}{2}}}{a} = \frac{1}{a} \sqrt{\frac{x}{2a-x}}.$$