

(3)

(2)

$$= \left( \frac{x^2}{2} \right) \Big|_0^{\sqrt{3}} + \left[ \frac{1}{\sqrt{3}} \tan^{-1} x \right] \Big|_0^{\sqrt{3}}$$

$$= \frac{(\sqrt{3})^2}{2} - (0)^2 + \frac{1}{\sqrt{3}} \left( \tan^{-1} \frac{\sqrt{3}}{3} - \tan^{-1} \frac{0}{3} \right)$$

$$= \left( \frac{3}{2} - 0 \right) + \frac{1}{\sqrt{3}} \left( \tan^{-1} \frac{1}{\sqrt{3}} - \tan^{-1} 0 \right)$$

$$= \frac{3}{2} + \frac{1}{3} \left( \frac{\pi}{6} - 0 \right)$$

$$= \frac{3}{2} + \frac{\pi}{18}$$

$$\left. \begin{aligned} \tan^{-1} \frac{1}{\sqrt{3}} &= \frac{\pi}{6} \\ \tan^{-1} 0 &= 0 \end{aligned} \right\}$$

Q4:-  $\int_0^{\pi/4} \sec x (\sec x + \tan x) dx$

Sol:-  $= \int_0^{\pi/4} (\sec^2 x + \sec x \tan x) dx$

$$= \int_0^{\pi/4} \sec^2 x dx + \int_0^{\pi/4} \sec x \tan x dx$$

$$= \left[ \tan x \right]_0^{\pi/4} + \left[ \sec x \right]_0^{\pi/4}$$

$$= \left( \tan \frac{\pi}{4} - \tan 0 \right) + \left( \sec \frac{\pi}{4} - \sec 0 \right)$$

$$(1 - 0) + (\sqrt{2} - 1) = \sqrt{2}$$

Q5:-  $\int_0^{\pi/4} \frac{1}{1 - \sin x} dx$

$$= \int_0^{\pi/4} \frac{1 + \sin x}{(1 - \sin x)(1 + \sin x)} dx$$