



Definite Integrals Ex 20.1 Q65

$$\begin{aligned}
 & \int_{\frac{\pi}{6}}^{\frac{\pi}{3}} (\tan^2 x + 2 \tan x \cot x + \cot^2 x) dx \\
 & \int_{\frac{\pi}{6}}^{\frac{\pi}{3}} \left\{ (\sec^2 x - 1) + 2 + (\operatorname{cosec}^2 x - 1) \right\} dx \\
 & \int_{\frac{\pi}{6}}^{\frac{\pi}{3}} \left\{ \sec^2 x + \operatorname{cosec}^2 x \right\} dx \\
 & \int_{\frac{\pi}{6}}^{\frac{\pi}{3}} \sec^2 x dx + \int_{\frac{\pi}{6}}^{\frac{\pi}{3}} \operatorname{cosec}^2 x dx \\
 & \left\{ \tan x \right\}_{\frac{\pi}{6}}^{\frac{\pi}{3}} + \left\{ -\cot x \right\}_{\frac{\pi}{6}}^{\frac{\pi}{3}} \\
 & \left\{ \sqrt{3} - \frac{1}{\sqrt{3}} \right\} - \left\{ \frac{1}{\sqrt{3}} - \sqrt{3} \right\} \\
 & 2 \left(\sqrt{3} - \frac{1}{\sqrt{3}} \right) \\
 & \frac{4}{\sqrt{3}}
 \end{aligned}$$

Definite Integrals Ex 20.1 Q66

$$I = \int_0^{\pi/4} (a^2 \cos^2 x + b^2 \sin^2 x) dx$$

$$I = \int_0^{\pi/4} (a^2(1 - \sin^2 x) + b^2 \sin^2 x) dx$$

$$I = \int_0^{\pi/4} (a^2 - a^2 \sin^2 x + b^2 \sin^2 x) dx$$

$$I = \int_0^{\pi/4} a^2 + (b^2 - a^2) \sin^2 x dx$$

$$I = \int_0^{\pi/4} a^2 + (b^2 - a^2) \frac{(1 + \cos 2x)}{2} dx$$

$$I = \left[a^2 x + \frac{(b^2 - a^2)}{2} \left(x + \frac{\sin 2x}{2} \right) \right]_0^{\pi/4}$$

$$I = \left[\frac{a^2 \pi}{4} + \frac{(b^2 - a^2)}{2} \left(\frac{\pi}{4} + \frac{1}{2} \right) \right]$$

$$I = \frac{(b^2 + a^2) \pi}{8} + \frac{(b^2 - a^2)}{4}$$

Definite Integrals Ex 20.1 Q67

$$\int_0^1 \frac{1}{x^4 + 2x^3 + 2x^2 + 2x + 1} dx$$

$$\int_0^1 \frac{1}{(x+1)^2(x^2+1)} dx$$

$$\int_0^1 \left\{ -\frac{x}{2(x^2+1)} + \frac{1}{2(x+1)} + \frac{1}{2(x+1)^2} \right\} dx$$

$$-\int_0^1 \frac{x}{2(x^2+1)} dx + \int_0^1 \frac{1}{2(x+1)} dx + \int_0^1 \frac{1}{2(x+1)^2} dx$$

$$-\left\{ \frac{\log(x^2+1)}{4} \right\}_0^1 + \left\{ \frac{\log(x+1)}{2} \right\}_0^1 - \left\{ \frac{1}{2(x+1)} \right\}_0^1$$

$$-\frac{\log 2}{4} + \frac{\log 2}{2} - \frac{1}{4} + \frac{1}{2}$$

$$\frac{\log 2}{4} + \frac{1}{4}$$

$$=(1/4)\log(2e)$$

***** END *****