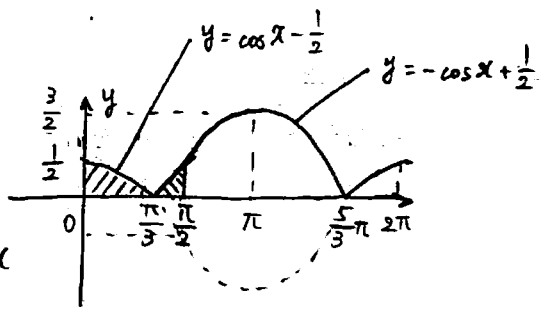


$$\int_0^{\frac{\pi}{2}} \left| \cos x - \frac{1}{2} \right| dx$$

$$= \int_0^{\frac{\pi}{3}} \left(\cos x - \frac{1}{2} \right) dx + \int_{\frac{\pi}{3}}^{\frac{\pi}{2}} \left(-\cos x + \frac{1}{2} \right) dx$$



$$= \left[\sin x - \frac{1}{2}x \right]_0^{\frac{\pi}{3}} + \left[-\sin x + \frac{1}{2}x \right]_{\frac{\pi}{3}}^{\frac{\pi}{2}}$$

$$= \sin \frac{\pi}{3} - \frac{\pi}{6} - \sin \frac{\pi}{2} + \frac{\pi}{4} + \sin \frac{\pi}{3} - \frac{\pi}{6}$$

$$= \frac{\sqrt{3}}{2} - \frac{\pi}{6} - 1 + \frac{\pi}{4} + \frac{\sqrt{3}}{2} - \frac{\pi}{6}$$

$$= \sqrt{3} - \frac{\pi}{3} + \frac{\pi}{4} - 1$$

$$= \boxed{\sqrt{3} - 1 - \frac{\pi}{12}}$$