

$$\begin{aligned}
 &= \int_{-1}^2 -(x-2) dx + \int_2^5 (x-2) dx \\
 &= \left[-\frac{x^2}{2} + 2x \right]_{-1}^2 + \left[\frac{x^2}{2} - 2x \right]_2^5 \\
 &= \left[-2 + 4 - \left(-\frac{1}{2} - 2 \right) \right] + \left[\frac{25}{2} - 10 - (2 - 4) \right] \\
 &= \left(2 + \frac{5}{2} \right) + \left(\frac{5}{2} + 2 \right) = \frac{9}{2} + \frac{9}{2} = 9
 \end{aligned}$$

Q4:- $\int_0^{3\pi/4} |\cos x| dx$

$$\begin{aligned}
 \int_0^{3\pi/4} |\cos x| dx &= \int_0^{\pi/2} |\cos x| dx + \int_{\pi/2}^{3\pi/4} |\cos x| dx \\
 &= \int_0^{\pi/2} \cos x dx + \int_{\pi/2}^{3\pi/4} (-\cos x) dx \\
 &= \left[\sin x \right]_0^{\pi/2} + \left[-\sin x \right]_{\pi/2}^{3\pi/4} \\
 &= \left(\sin \frac{\pi}{2} - \sin 0 \right) + \left[-\sin \frac{3\pi}{4} - \left(-\sin \frac{\pi}{2} \right) \right] \\
 &= (1 - 0) + \left(-\frac{1}{\sqrt{2}} - (-1) \right) \\
 &= 1 - \frac{1}{\sqrt{2}} + 1 = 2 - \frac{1}{\sqrt{2}}
 \end{aligned}$$

(ii) $\int_0^{2a} f(x) dx = \int_0^a f(x) dx + \int_0^a f(2a-x) dx$

(i) $\int_0^a f(x) dx = \int_0^a f(a-x) dx$

Q5:- $\int_0^{\pi} \cos x dx$