$$= \int_0^{\pi/4} \frac{1+\sin x}{1-\sin^2 x}\,dx = \int_0^{\pi/4} \frac{1+\sin x}{\cos^2 x}\,dx$$

$$= \int_0^{\pi/4} \left(\frac{1}{\cos^2 x} + \frac{\sin x}{\cos^2 x}\right) dx$$

$$= \int_0^{\pi/4} (\sec^2 x + \sec x \tan x)\,dx = \sqrt{2} \text{ Ans}$$

Just like Q#4

Q6:- $\int_{-1}^{2} (x + |x|)\,dx$

$$= \int_{-1}^{0} [x + |x|]\,dx + \int_0^2 (x + |x|)\,dx$$

$|x| = -x$ if $x < 0$
$= x$ if $x \geq 0$

$$= \int_{-1}^{0} (x + (-x))\,dx + \int_0^2 (x + (x))\,dx$$

$$= \int_{-1}^{0} 0\,dx + \int_0^2 2x\,dx = 0 + 2\int_0^2 x\,dx$$

$$= 2\left[\frac{x^2}{2}\right]_0^2 = 2\left(\frac{4}{2} - \frac{0}{2}\right) = 4$$

Q7:- Evaluate $\int_0^{\sqrt{7}} \frac{3x}{\sqrt{x^2+9}}\,dx$

Let $f(x) = x^2+9$, then $f'(x) = 2x$,

$$= \frac{3}{2}\int^{\sqrt{7}} \frac{2x}{(x^2+9)^{\frac{1}{2}}}\,dx$$