

$$= \int_1^2 \left(\frac{x^2-1}{x+1} + \frac{2}{x+1} \right) dx$$

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$$= \int_1^2 \left(x-1 + \frac{2}{x+1} \right) dx$$

$$= \int_1^2 x dx - \int_1^2 1 dx + 2 \int_1^2 \frac{1}{x+1} dx$$

$$= \left[\frac{x^2}{2} \right]_1^2 - [x]_1^2 + 2 \left[\ln(x+1) \right]_1^2$$

$$= \left[\frac{(2)^2}{2} - \frac{(1)^2}{2} \right] - [2-1] + 2 \left[\ln(2+1) - \ln(1+1) \right]$$

$$= \left(\frac{2}{2} - \frac{1}{2} \right) - 1 + 2 \left[\ln 3 - \ln 2 \right]$$

$$= \frac{1}{2} + 2 \ln 3 - 2 \ln 2$$

Q3:- Evaluate $\int_0^{\sqrt{3}} \frac{x^3+9x+1}{x^2+9} dx$

$$\int_0^{\sqrt{3}} \frac{x^3+9x+1}{x^2+9} dx = \int_0^{\sqrt{3}} \left(\frac{x^3+9x}{x^2+9} + \frac{1}{x^2+9} \right) dx$$

$$= \int_0^{\sqrt{3}} \left(\frac{x(x^2+9)}{x^2+9} + \frac{1}{x^2+9} \right) dx$$

$$= \int_0^{\sqrt{3}} x dx + \int_0^{\sqrt{3}} \frac{1}{(x)^2+(3)^2} dx$$