

$$\text{Let, } I = \int \frac{1 + x^{1/4}}{1 + x^{1/2}} dx \quad \text{and, } x = z^4$$

$$\text{So, } dx = 4z^3 dz$$

Now,

$$I = \int \frac{(1 + z)4z^3 dz}{1 + z^2} = 4 \int \frac{z^4 + z^3}{1 + z^2} dz$$

$$= 4 \int \frac{z^2(z^2 + 1) - (z^2 + 1) + z(z^2 + 1) - z - 1}{1 + z^2} dz$$

$$= 4 \left\{ \int (z^2 - 1 + z) dz - \int \frac{z dz}{z^2 + 1} - \int \frac{dz}{z^2 + 1} \right\}$$

$$= 4 \left\{ \frac{z^3}{3} - z + \frac{z^2}{2} - \frac{1}{2} \ln(z^2 + 1) - \tan^{-1} z \right\} + c$$

$$= 4 \left\{ \frac{x^{3/4}}{3} - x^{1/4} + \frac{x^{1/2}}{2} - \frac{1}{2} \ln(x^{1/2} + 1) \right.$$

$$\left. - \tan^{-1} x^{1/4} \right\} + c$$

$$[z = x^{(1/4)}]$$

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