Q2-DOC

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$w(x) = x^{-\frac{1}{2}}$ given

① $p(x) = \dfrac{x^{-\frac{1}{2}}}{\int_0^1 x^{-\frac{1}{2}} dx} = \dfrac{1}{2\sqrt{x}}$

$\int_0^1 w(x)\, dx = \int_0^1 x^{-\frac{1}{2}} dx = 2.$

Thus $\Rightarrow$ Transformation formula.

$$\int_0^{x(z)} \frac{1}{2\sqrt{x'}} dx' = \int_0^{x(z)} \frac{1}{2} (x')^{-\frac{1}{2}} = \left[x'^{\frac{1}{2}} \right]_0^{x(z)} = z$$

$$z^2 = x$$

$$I \approx \frac{1}{N} \sum_{i=1}^{N} \frac{f(x_i)}{w(x_i)} \int_a^b w(x)\, dx$$

$$= \frac{2}{1000000} \sum_{i=1}^{1000000} \frac{1}{e^{x}+1} = \frac{2}{1000000} \sum_{i=1}^{1000000} \frac{1}{e^{z^2}+1}$$

The formula used are listed in the book as 10.42,10.39 and 10.7. and the derivation as shown above.