COMPUTATIONAL PHYSICS (PHY241)

HOMEWORK ASSIGNMENT 8

Due Date: **Thursday, April 7, 2022**

Calculate a value for the integral

$$I = \int_0^1 \frac{x^{-1/2}}{e^x + 1}\, dx,$$

using the importance sampling formula, Eq. (10.42), with $w(x) = x^{-1/2}$, as follows.

1. Show that the probability distribution $p(x)$ from which the sample points should be drawn is given by

   $$p(x) = \frac{1}{2\sqrt{x}}$$

   and derive a transformation formula for generating random numbers between zero and one from this distribution.

2. Using your formula, sample $N = 1\,000\,000$ random points and hence evaluate the integral. You should get a value around 0.84.