LCG a: b $m = 2^p - 1$

$\Rightarrow$ x_0

$$x_i = a x_{i-1} + b \pmod m$$

$$y_i = \frac{x_i}{m}$$

$$x_1 = a x_0 + b \pmod m$$

$$x_2 = a x_1 + b \pmod m$$

(2) $F(x) =$ $f(x) = 2e^{-2x}$

$$F(x) = \int_{-\infty}^{\infty} f(z)\,dz = \int_0^x f(z)\,dz = \int_0^x 2e^{-2z}\,dz$$

(a)

$$= \left(-e^{-2z}\right)_0^x = -e^{-2x} + 1 = \boxed{1 - e^{-2x}}$$

$$F(x) = u \longrightarrow u = 1 - e^{-2x} \longrightarrow u - 1 = -e^{-2x}$$

$$\longrightarrow 1 - u = e^{-2x} \longrightarrow -2x = \log(1-u)$$

$$\longrightarrow x = -\frac{1}{2}\log(1-u) \longrightarrow x = \log\frac{1}{\sqrt{1-u}}$$

$a \log b = \log b^a$