$$P(x) = \frac{c\, e^{-c(x-a)}}{Z}$$

$$1 = \frac{c}{Z}\int_a^b dx\, e^{-c(x-a)}$$

$$= \frac{c}{Z} e^{ca} \int_a^b dx\, e^{-cx}$$

$$= \frac{c}{Z} e^{ca} \left[-\frac{e^{-cx}}{c} \right]_a^b$$

$$= \frac{\cancel{c}}{Z} e^{ca} \left[\frac{-e^{-cb} + e^{-ca}}{\cancel{c}} \right]$$

$$= \frac{-e^{ca} e^{-cb} + 1}{Z}$$

$$1 = \frac{1 - e^{c(a-b)}}{Z}$$

$$\Rightarrow \quad Z = 1 - e^{c(a-b)} = 1 - e^{-c(b-a)}$$

$$P(y) = \frac{c\, e^{-c(y-a)}}{Z}$$

$$\Rightarrow x(y) = \int_a^y p(y')\, dy'$$

$$= \frac{c}{Z} e^{ca} \int_a^y e^{-cy'} dy'$$

$$= \frac{c e^{ca}}{Z} \left[-\frac{1}{c} e^{-cy'} \right]_a^y$$

$$x(y) = -\frac{e^{ca}}{Z} \left[e^{-cy} - e^{-ca} \right]$$

Solve for y:

$$\Rightarrow Z x = 1 - e^{-c(y-a)}$$

$$\Rightarrow e^{-c(y-a)} = 1 - Zx$$

$$\Rightarrow -c(y-a) = \ln(1 - Zx)$$

$x \in U(0,1)$

$$\Rightarrow \boxed{y = -\frac{\ln(1-Zx)}{c} + a}$$

RVS from Truncated Exponential

RVS