

Exercise 2.7

$$(a) S_0(x) = 1 - F_0(x) = \frac{1}{1+x}$$

$$(b) f_0(x) = \frac{dF_0(x)}{dx} = \frac{1}{(1+x)^2}$$

$$(c) S_x(t) = {}_t p_x = \frac{S_0(x+t)}{S_0(x)} = \frac{1+x}{1+x+t} = 1 - \frac{t}{1+x+t}$$

$$(d) p_{20} = S_{20}(1) = \frac{21}{22} = 0.9545455$$

$$(e) {}_{10|5}q_{30} = {}_{10}p_{30} - {}_{15}p_{30} = \frac{31}{41} - \frac{31}{46} = 0.08218452$$