

Formulae to memorise:

SECTION I

$$v = \frac{1}{1+i}, \quad 1+i = e^\delta, \quad d = iv.$$

$$1+i = \left(1 + \frac{i^{(p)}}{p}\right)^p, \quad i^{(p)} = p(e^{\delta/p} - 1), \quad 1-d = \left(1 - \frac{d^{(p)}}{p}\right)^p, \quad d^{(p)} = p(1 - e^{-\delta/p}).$$

SECTION 2

$$s(x) = P(X > x), \quad f_X(x) = -\frac{d}{dx}s(x), \quad F_X(x) = 1 - s(x).$$

$$f_{T(x)}(t) = -\frac{1}{s(x)} \frac{d}{dx}s(x+t) = {}_t p_x \mu(x+t). \quad \mu(x) = -\frac{1}{s(x)} \frac{d}{dx}s(x) = -\frac{d}{dx} \ln s(x).$$

$$l_x = l_0 s(x), \quad {}_t d_x = l_x - l_{x+t}, \quad d_x = l_x - l_{x+1}.$$

$${}_t p_x = P(X > x+t | X > x) = P(T(x) > t), \quad {}_t p_x = \frac{l_{x+t}}{l_x}, \quad p_x = \frac{l_{x+1}}{l_x}.$$

$${}_t q_x = P(X < x+t | X > x) = P(T(x) < t), \quad {}_t q_x = \frac{l_x - l_{x+t}}{l_x}, \quad q_x = \frac{l_x - l_{x+1}}{l_x}.$$

$${}_{t|u} q_x = P(x+t < X < x+t+u | X > x) = P(t < T(x) < t+u), \quad {}_{t|u} q_x = \frac{l_{x+t} - l_{x+t+u}}{l_x}.$$

$$\overset{\circ}{e}_x = E(T(x)) = \int_0^\infty t f_{T(x)}(t) dt, \quad \overset{\circ}{e}_x \approx e_x + \frac{1}{2}.$$

$$\overset{\circ}{e}_x = \frac{1}{s(x)} \int_0^\infty s(x+t) dt \quad \text{under appropriate conditions on } s(x).$$

$$P(K(x) = k) = {}_k p_x - {}_{k+1} p_x = {}_{k|1} q_x, \quad e_x = E(K(x)) = \sum_{k=0}^\infty k P(K(x) = k).$$

$$e_x = \frac{1}{l_x} \sum_{k=1}^\infty l_{x+k} \quad \text{under appropriate conditions on } s(x).$$

SECTION 3

$$D_x = v^x l_x, \quad N_x = \sum_{k=0}^\infty D_{x+k}, \quad {}_m V_x = 1 - \frac{\ddot{a}_{x+m}}{\ddot{a}_x}.$$