

After-class exercise for lecture 12

36-313, Fall 2022

Due by 6 pm on Friday, 7 October 2022

The CDC prepares annual life tables based on the “national vital statistics system”, i.e., official registries of births and deaths. You can find the 2018 life table report at [<https://www.cdc.gov/nchs/data/nvsr/nvsr69/nvsr69-12-508.pdf>]. Table 1, on pp. 10–11, gives the over-all life table for the whole population. (There is also a spreadsheet version at [https://ftp.cdc.gov/pub/Health_Statistics/NCHS/Publications/NVSR/69-12/Table01.xlsx] which you might find easier to work with.)

1. (4 points) Make a curve showing the probability of dying between age t and $t + 1$, *given that* someone has survived to at least age t . Use a logarithmic scale on the vertical axis. *Hint*: This is actually a column in the table (which?), and can also be calculated from two other columns (which?).
2. (3) Describe the shape of the curve.
3. (2) Make a curve showing the un-conditional probability of dying between age t and $t + 1$. *Hint*: This is proportional to a column in the table (which?).
4. (1) Describe the shape of the curve.