22. For the following functions, prove they are cumulative distribution functions (CDFs) and find the corresponding probability density functions (PDFs). Use R to create side-by-side graphs of the CDFs and PDFs.

    (a) $F(X) = \frac{1}{2} + \frac{1}{\pi}\arctan(x), x \in (-\infty, \infty)$

    (b) $F(X) = (1 + e^{-x})^{-1}, -\infty < x < \infty$