

# Figures for HW

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*This documents contains figures for HW showing the convergence of the sequence of functions*

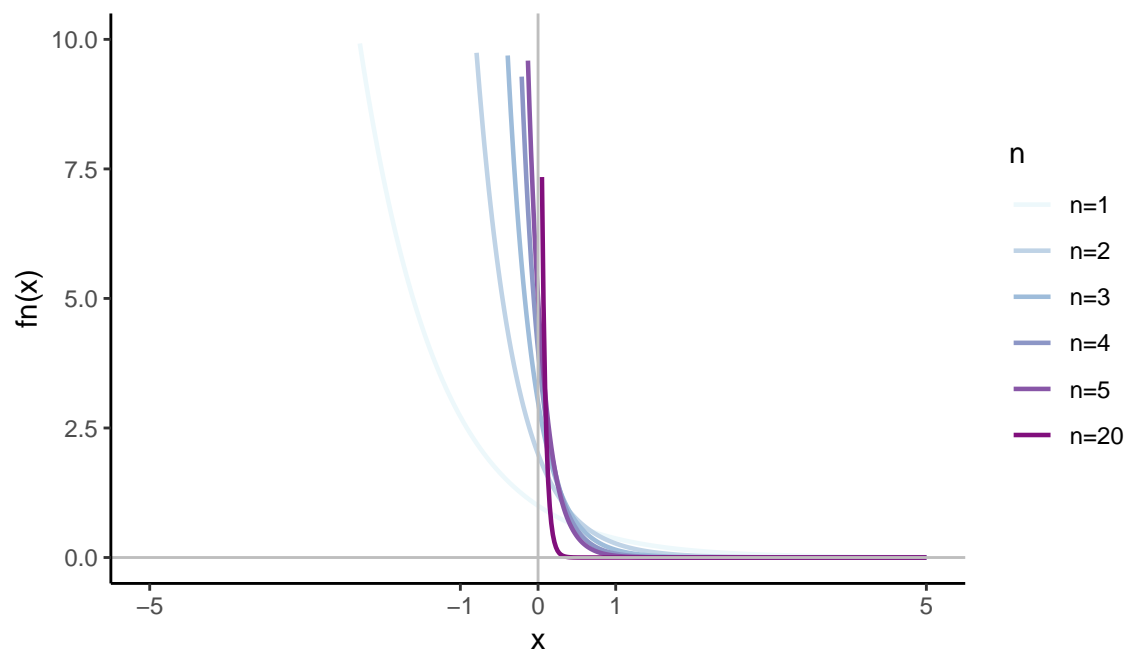
## HW4 P159, 26, 29, 30, Prob. C, D

Only plot the sequence of functions  $f_n(x)$ , not the sum.

**29**

$$f_n(x) = ne^{-nx}$$

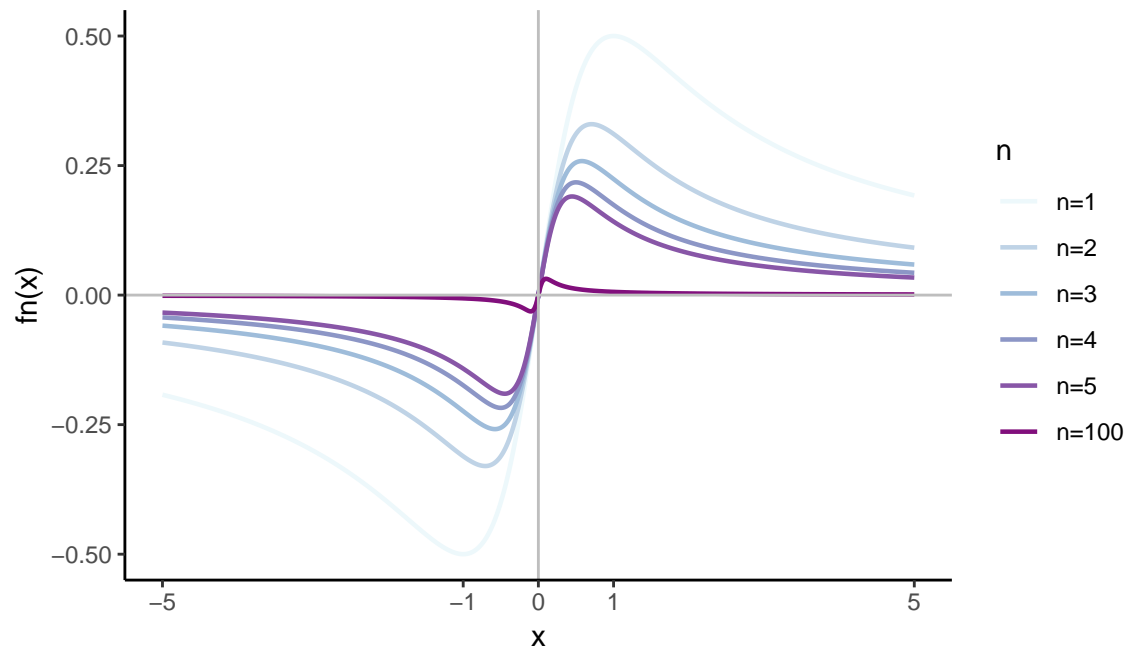
Notice that when  $x = 0$ ,  $f_n(x) = n$



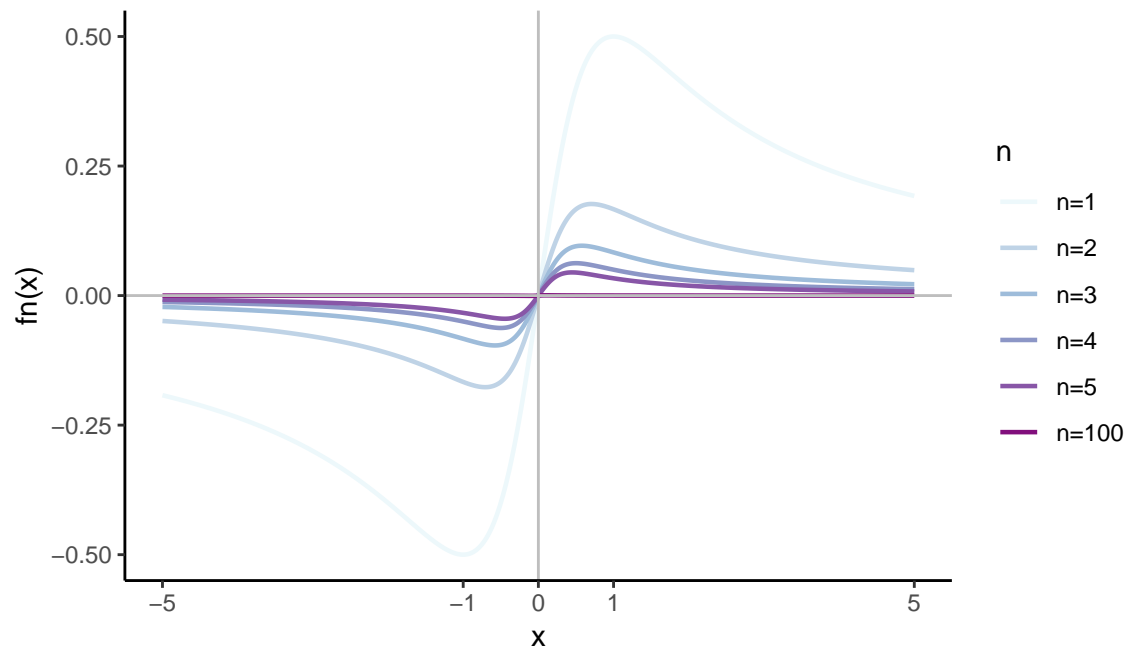
30

$$f_n(x) = \frac{x}{n^a(1 + nx^2)}$$

If  $a = 0.1$



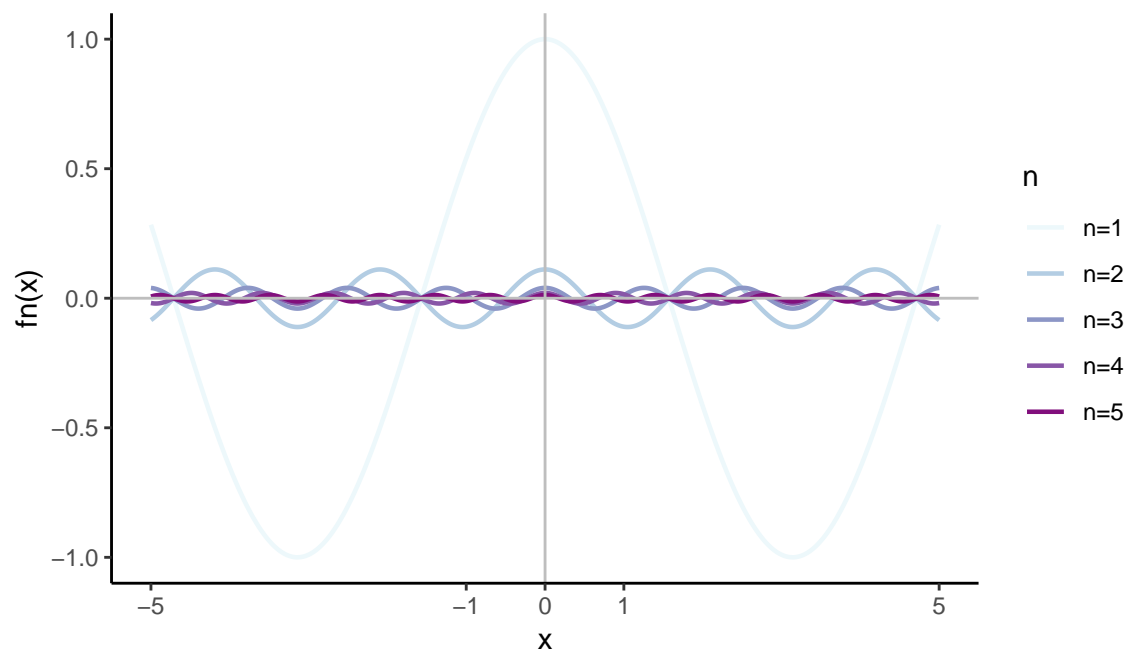
If  $a = 1$



### Prob C

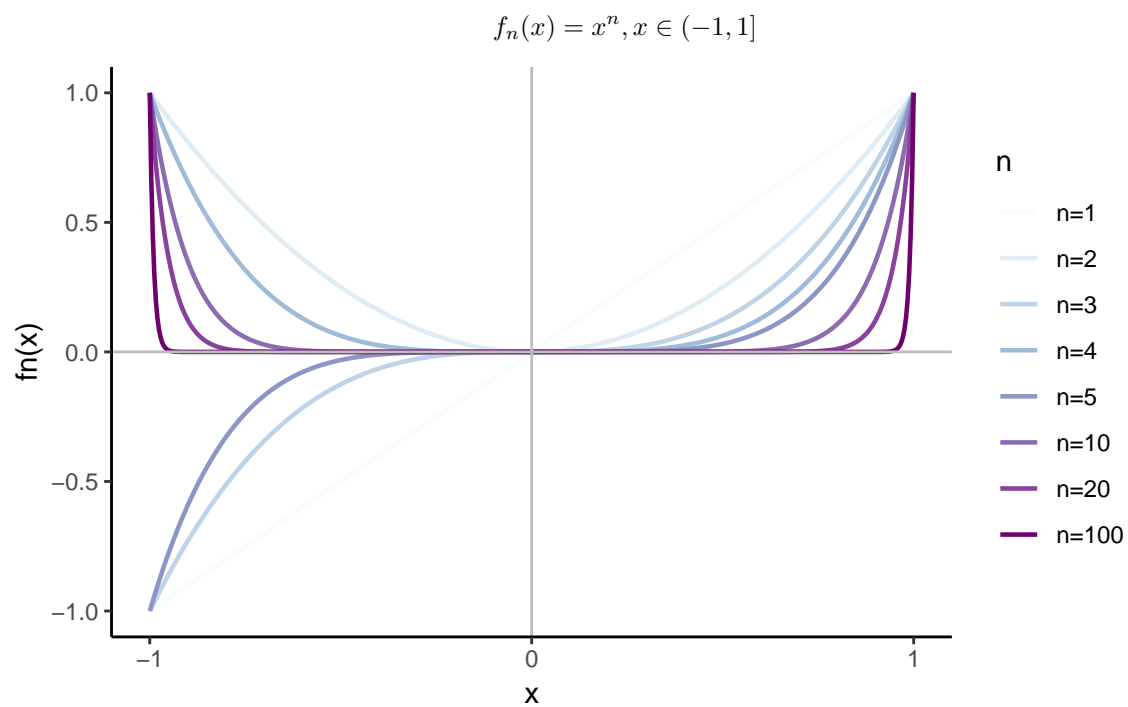
$$f_n(x) = \frac{\cos[(2n-1)x]}{(2n-1)^2}$$

Notice that if  $n = 1$ ,  $f_n(x) = \cos(x)$

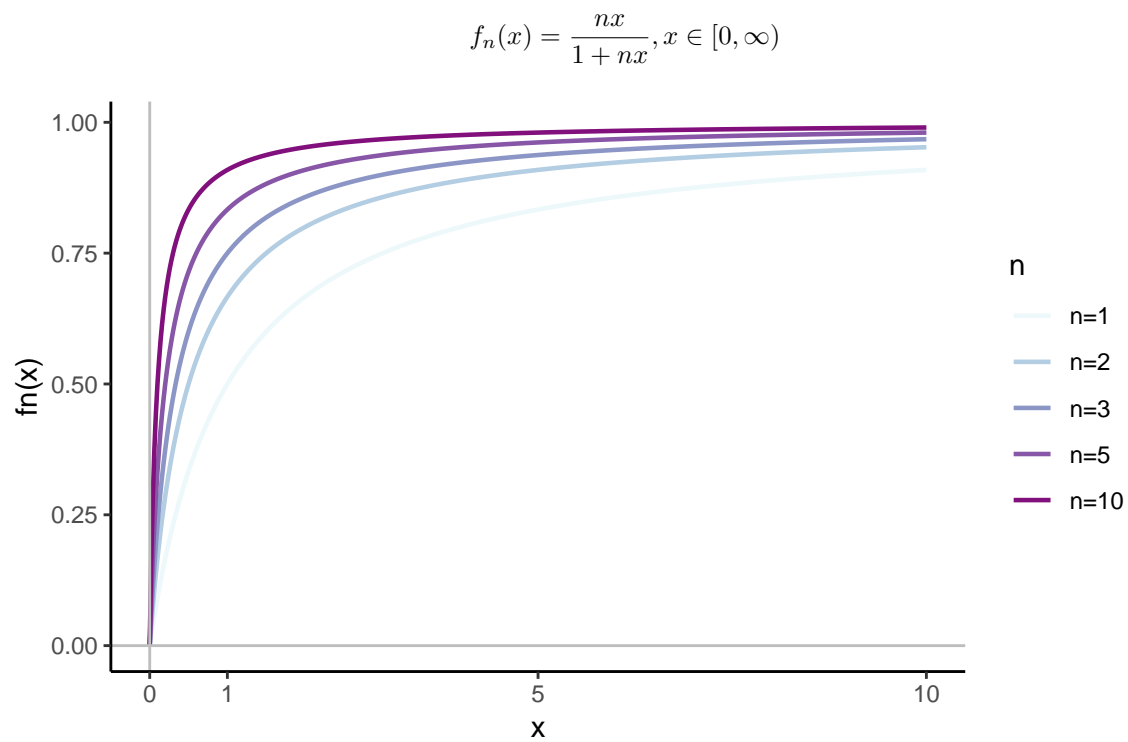


## HW3 P149, 9: a, c, d, e, f and Prob.B

9.a

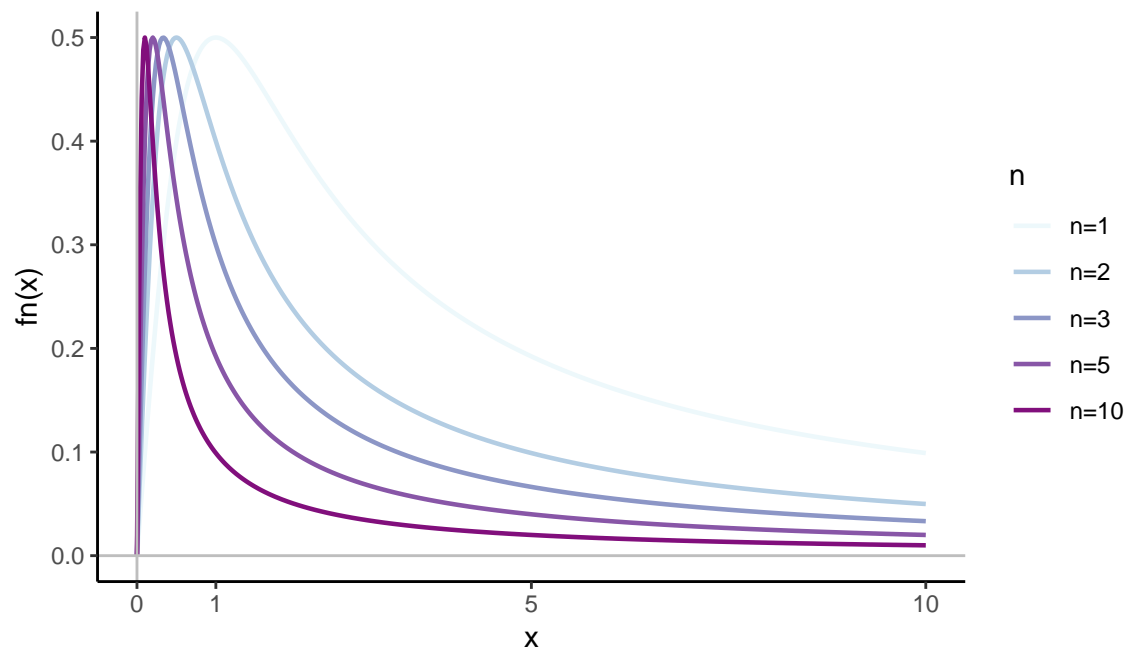


9.c



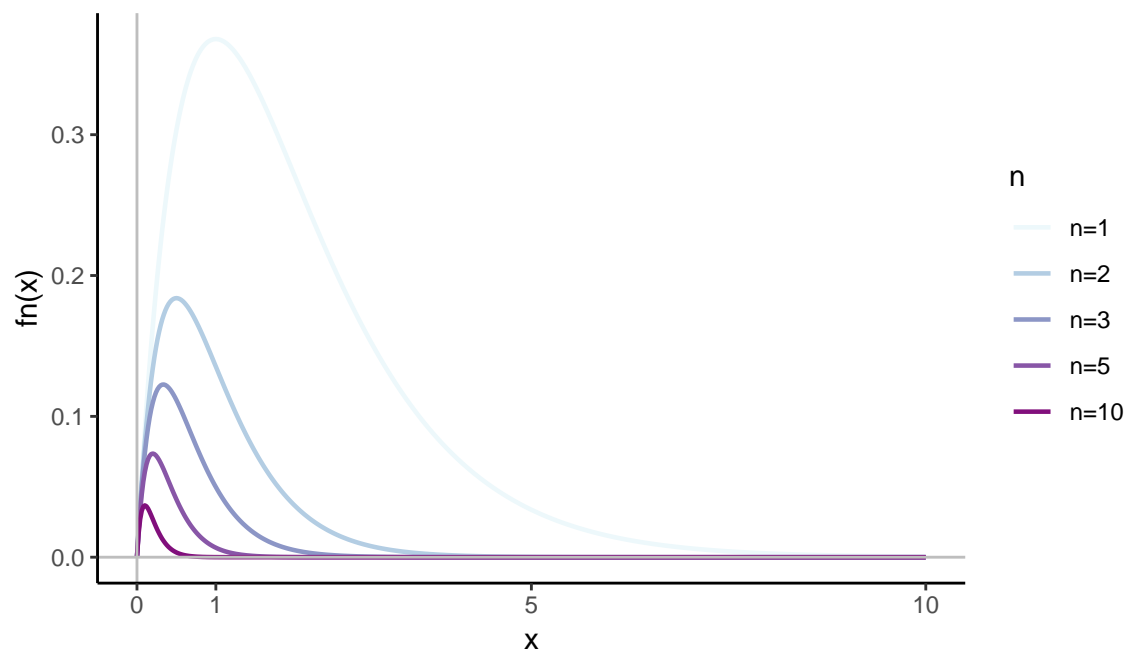
9.d

$$f_n(x) = \frac{nx}{1 + (nx)^2}, x \in [0, \infty)$$



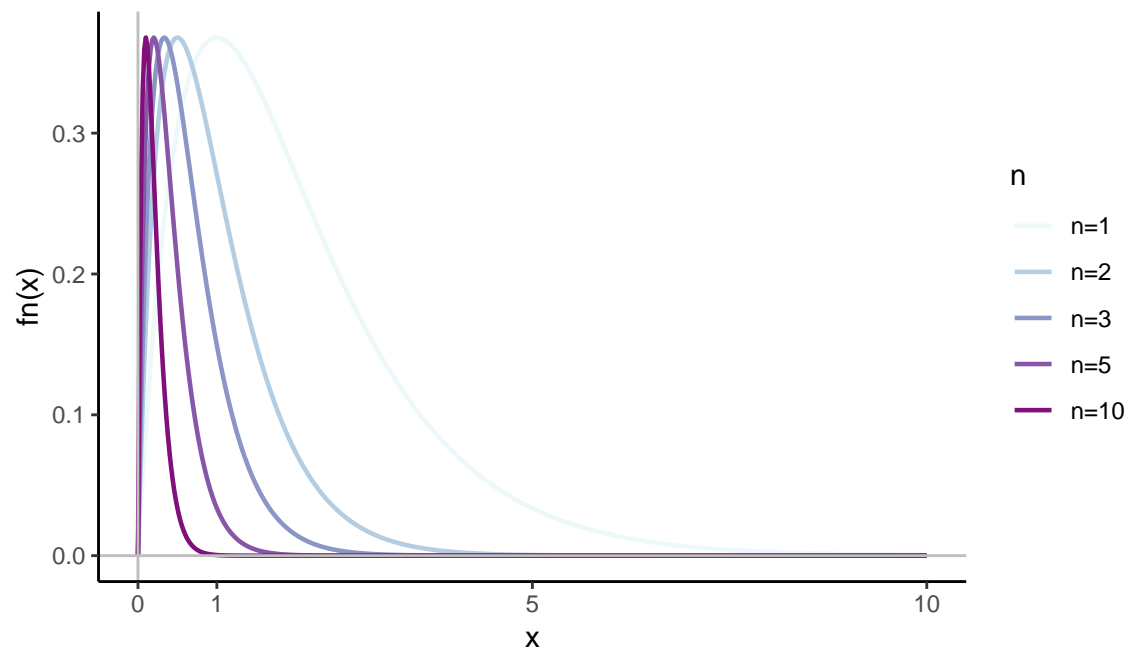
9.e

$$f_n(x) = xe^{-nx}, x \in [0, \infty)$$



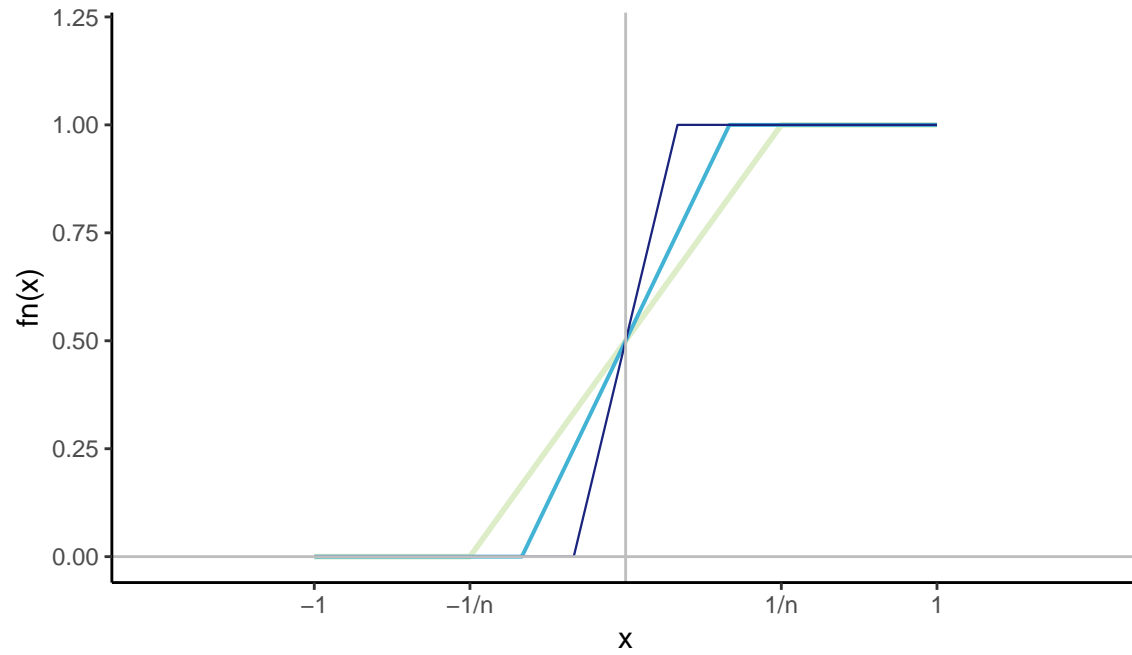
9.f

$$f_n(x) = nxe^{-nx}, x \in [0, \infty)$$



Prob. B

$$f_n(x) = \begin{cases} 0 & \text{if } x \in [-1, -\frac{1}{n}] \\ \frac{n}{2}x + \frac{1}{2} & \text{if } x \in [-\frac{1}{n}, \frac{1}{2}] \\ 1 & \text{if } x \in (\frac{1}{n}, 1] \end{cases}$$



## Code

This document is reproducible in R using Rmarkdown, code is host on my github: (here is the link).