

31. Compute  $E[X]$  and  $\text{Var}(X)$  for the following distribution functions.

(a)  $f_X(x) = ax^{a-1}, \quad 0 < x < 1, a > 0.$

(b)  $f_X(x) = n^{-1}, \quad x = 1, 2, \dots, n, n > 0$  where  $n$  is an integer.

(c)  $f_X(x) = \frac{3}{2}(x-1)^2, \quad 0 < x < 2.$