

Quiz 2

Friday, July 19, 2013 11:39 AM

Suppose a RV X has pmf

$$P_X(x) = \begin{cases} \frac{c}{x^2}, & x = -2, -1, 1, 2, 3 \\ 0, & \text{otherwise.} \end{cases}$$

3 pt (a) Find c

1 pt (e) $P[X > 2.5]$

2 pt (b) sketch the pmf

1 pt (f) Plot $P[X \leq x]$

1 pt (c) $P[X = 2]$

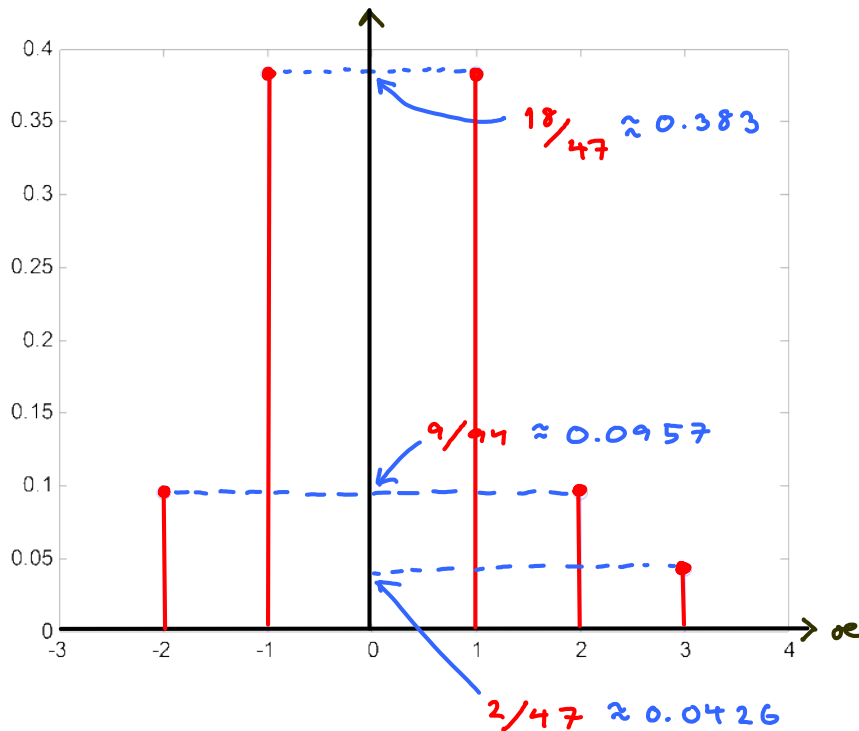
2 pt (d) $P[X \leq 1.5]$

Solutions:

(a) We use the fact that $\sum_x P_X(x) = 1$.

$$\text{So, } \frac{c}{(-2)^2} + \frac{c}{(-1)^2} + \frac{c}{1^2} + \frac{c}{2^2} + \frac{c}{3^2} = 1 \Rightarrow c = \frac{18}{47} \approx 0.383$$

(b) We simply plug-in $c = \frac{18}{47}$ into the given expression for pmf.



$$(c) P[X = 2] = P_X(2) = \frac{9}{94} \approx 0.0957$$

$$(d) P[X \leq 1.5] = P[X = -2] + P[X = -1] + P[X = 1] = \frac{9}{94} + \frac{18}{47} + \frac{18}{47} = \frac{81}{94} \approx 0.8617$$

$$(e) P[X > 2.5] = P[X = 3] = \frac{2}{47} \approx 0.0426$$

(f) $P[X \leq x]$ ← this is the CDF of X .

We add $p_X(\cdot)$ upto $p_X(x)$.

