[3] ✓

Recitation: sampling people on buses

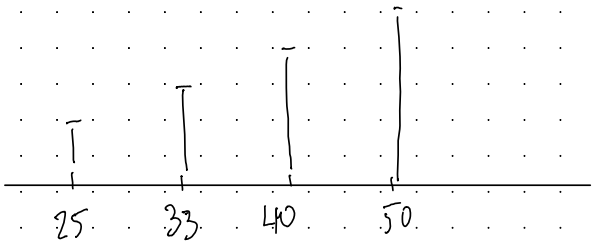
Total: 148

X: number of students in the bus of the selected student

Y: -11- driver

Buses

40	33	25	50



$E[X] > E[Y]$

$$P_X(x) = \begin{cases} 40/148 & x = 40 \\ 33/148 & x = 33 \\ & \vdots \end{cases}$$

$$P_Y(y) = \begin{cases} \frac{1}{4} & y = 40 \\ -\|- & \\ 0 & \text{otherwise} \end{cases}$$

$$E[Y] = \frac{75}{2} = 37{,}5$$

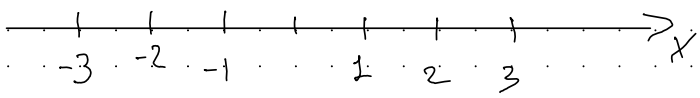
$$E[X] = 25 \cdot \frac{25}{148} + \frac{33^2}{148} + \frac{40^2}{148} + \frac{50^2}{148} =$$

$$= \frac{5865}{148} \approx 39{,}6$$

Recitation: PMF of a function of a random variable

$$P_X(x) = \frac{x^2}{a} \qquad x \in \{-3, -2, -1, 1, 2, 3\}$$

a) Find a

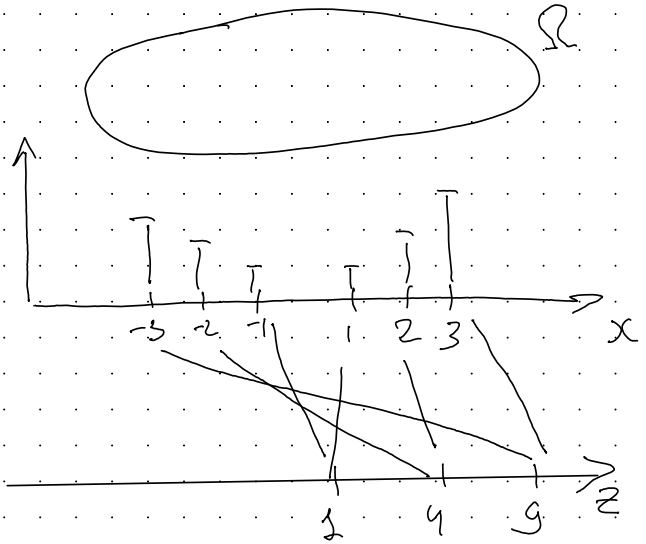


$$\left(\frac{9}{a} + \frac{4}{a} + \frac{1}{a}\right)2 = 1$$

$$\frac{14}{a} = \frac{1}{2}$$

$$a = 28$$

b) Find PMF of $Z = X^2$



$Z = X^2$

$P_Z(k) = \mathbb{P}(Z = k)$ $\quad z \in \{9, 4, 1\}$

$P_Z(k) = 2\frac{k^2}{9}$

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