Assignment 1

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and latex-tikz codes from

QUESTION 5.28

Let X denote the number of hours you study during a randomly selected school day. The probability that X can take the values x, has the following form, where k is some unknown constant.

$$Pr(X = x) = \begin{cases} .1, & if\ x = 0 \\ kx, & if\ x = 1,2 \\ k(5\text{-}x), & if\ x = 3,4 \\ 0, & otherwise \end{cases}$$

a) Find the value of k. b) What is the probability that you study at least two hours ? Exactly two hours? At most two hours?

SOLUTION

a)The value of k

Sum of Probabilities equals 1

$$\sum_{r=0}^{n} Pr(X = r) = 1 \tag{0.0.2}$$

$$k = 0.15 \tag{0.0.3}$$

b)
the probability that you study at least two hours is

$$Pr(X \geq 2) = \sum_{r=2}^{n} Pr(X = r) \tag{0.0.4}$$

$$Pr(X \geq 2) = 0.75 \tag{0.0.5}$$

The probability that you study Exactly two hours is

$$Pr(X = 2) = 0.3 \tag{0.0.6}$$

The probability that you study at most two hours is

$$Pr(X \leq 2) = \sum_{r=0}^{2} Pr(X = r) \tag{0.0.7}$$

$$Pr(X \leq 2) = 0.55 \tag{0.0.8}$$