



## Esercizi per il corso di Probabilità e Statistica



Luigi Miazzo

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Soluzioni all'esercizio del 2022-04-14 creato per luigi.miazzo

### Quesiti e soluzioni

Sia X una variabile aleatoria discreta su  $\mathbb R$  con supporto  $R_X=\{2,3,8,9,10,14,15,17,18,20\}.$ 

#### Quesito 1

Si consideri la funzione p(x) definita in  $\mathbb R$  che su  $R_X$  assume i valori riportati in tabella ed è nulla altrimenti (i.e., p(x)=0 per  $x
ot\in R_X$ ).

x = 2.000 = 3.000 = 3.000 = 3.000 = 10.000 = 14.000 = 15.000 = 17.000 = 18.000 = 20.000 = 17.000 = 18.000 = 18.000 = 17.000 = 18.000 =

Rispondere TRUE o FALSE .

Dobbiamo verificare che siano rispettate le condizioni della Def. 33 e Thm. 10 delle note del corso, ossia:

$$p(x) \geq 0$$
 per ogni  $x \in \mathbb{R}$  e  $\sum_{x \in R_X} p(x) = 1$ .

- La risposta corretta è: FALSE
- La risposta inserita è: FALSE
- che corrisponde a FALSE

# Quesito 2

Se p(x) non è una densità discreta, si modifichi il valore di p(8) in modo che p(x) diventi una densità discreta valida e si risponda ai seguenti quesiti utilizzando la nuova p(x) corretta.

Qual è la probabilità che X sia uguale a 17 o a 15? In altre parole: quanto vale  $P(X \in \{17,15\})$ ?

Definiamo  $R_X^* = \setminus \{8\}$  Affinché p(x) sia una densità discreta valida, basta porre  $p(8) = 1 - \sum_{x \in R_X^*} p(x) = 0.178$ .

Dopodiché la probabilità richiesta è data dalla somma p(17)+p(15)

- La risposta corretta è: 0.248
- La risposta inserita è: 0.248
- che corrisponde a 0.248

### Quesito 3

Si considerino ora i seguenti valori

x 1.000 2.000 3.000 4.000 5.000 6.000 7.000 8.000 9.000 10.000 p(x) 0.140 0.020 0.150 0.140 0.090 0.160 0.120 0.030 0.000 0.150

Qual è la probabilità che X sia un qualsiasi numero pari o un numero divisibile per 3?

Qui notiamo che l'intersezione dei due eventi  $X \in \{2,4,6,8,10\}$  e  $X \in \{3,6,9\}$  è non vuota, per cui alla somma delle rispettive probabilità dobbiamo sottrarre la probabilità dell'intersezione.

- La risposta corretta è: 0.65
- La risposta corretta e. 0.65
  La risposta inserita è: 0.65
- La risposta inserita e: 0
  che corrisponde a 0.65