

Answer on Question #59157 – Math – Statistics and Probability

Question

100 people bought tickets in a charity raffle. 60 of them bought the tickets because they supported the charity. 75 bought tickets because they liked the prize. The probability that the prize was won by someone who both supported the charity and liked the prize is 35 %. No one who neither supported nor liked the prize bought the tickets.

1. What is the probability that the prize-winning ticket was bought by someone who liked the price?
2. What is the probability that the prize was won by someone who did not support the charity?
3. What is the probability that the price was won by someone who either supported charity or liked the prize?

Solution

1. Let A and B be the events “liked the prize” and “support the charity” respectively. To find $Pr(A)$, we apply the three steps as follows:

i. $N = 100$

ii. $n(A) = 75$

iii. Therefore

$$Pr(A) = \frac{n(A)}{N} = \frac{75}{100} = 0.75.$$

2. To find $Pr(\bar{B})$, we only have to go through steps ii and iii.

$$n(\bar{B}) = 100 - 60 = 40.$$

Thus,

$$Pr(\bar{B}) = \frac{n(\bar{B})}{N} = \frac{40}{100} = 0.4.$$

3. It is given that $Pr(A \cap B) = 0.35$. The probability that the price was won by someone who either supported charity or liked the prize is

$$Pr(A \cup B) = Pr(A) + Pr(B) - Pr(A \cap B) = 0.60 + 0.75 - 0.35 = 1.$$

Answer: 1. 0.75. 2. 0.4. 3. 1.