

# Propz Test

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11 de maio de 2020

Question 2. Some assumptions I made so I could solve this exercise:

- 1. All elements are integers. This is not explicit said and I based this only on the options given;
- 2. The set can be of any possible size. Different sets can lead to the same mean and the size is also not given;
- 3. At least 4 of the possible options should be in the set.

Ok, given this, my answer is option A) 30. First of all, the only rule explicit in the question is that

$$x_{max} = 5 + 2 * x_{min}$$

So, if  $x_{min} = 30$ ,  $x_{max} = 90$  and all other options greater than  $x_{max}$  would be outside the set. From 50 on, it's possible to find a set with all the options and mean = 100 for example  $[50, 70, 71, 70, 120, 154, 155]$ , where  $x_{min} = 50$  and  $x_{max} = 155$ , satisfying the  $x_{max} = 5 + 3 * x_{min}$  condition.

Question 4 Considering that the costumers buy ONLY in the store of the mentioned probability (this is not explicit in the question), we have 50% buying in A, 30% buying in B and 20% buying in C

- a. for A store, the answer rate is 50%. so 50% of the costumers did not answer. So here we have 50% (not-answering-rate) of 50% (costumer that buy at A) and we can manage to find our

$$P(didn't answer|A) = 0.5 * 0.5 = 0.25$$

using the same technique, we have

$$P(didn't answer|B) = 0.4 * 0.3 = 0.12$$

and

$$P(didn't answer|C) = 0.1 * 0.2 = 0.02$$

Now, knowing the "didn't aswer rate" of all three stores, we can know too the general rate by summing them:  $0.25 + 0.12 + 0.02 = 0.39$

or 39%. So this is the probability that a random customer didn't answer the campaign.

$$P(didn't answer) = 0.39$$

**b.** To find out a responder that went to C, we can apply Bayes

$$\begin{aligned} P(C|answered) &= \frac{P(answered|C) \cdot P(C)}{P(answered)} \\ &= \frac{0.9 \cdot 0.2}{0.61} \\ &= 0.2951 \end{aligned}$$

So the probability is 29.51%

Question 5 The probability of getting one the b type dice ( $P(b)$ ) is  $3/12$  and the probability of getting a six is 0.85, so the conditional probability is of 0.2125 or 21.25%