11. Exercise: The binomial PMF

Exercises due Feb 28, 2020 05:29 IST *Completed*

Exercise: The binomial PMF

2/2 points (graded)

You roll a fair six-sided die (all 6 of the possible results of a die roll are equally likely) 5 times, independently. Let X be the number of times that the roll results in 2 or 3. Find the numerical values of the following.

a) $p_X(2.5) =$ 0 ✔ **Answer:** 0

b) $p_X(1) =$ 80/243 ✔ **Answer:** 0.32922

Solution:

a) A value of 2.5 is not possible for X since the number of rolls must be an integer, and therefore $p_X(2.5) = 0$.

b) For each die roll, there is a probability $2/6 = 1/3$ of obtaining a 2 or a 3. Hence, the random variable X is binomial with parameters $n = 5$ and $p = 1/3$, so that $p_X(1) = \binom{5}{1} \cdot (1/3) \cdot (2/3)^4 \approx 0.32922$.

Submit You have used 2 of 3 attempts

Answers are displayed within the problem

Discussion

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- Why px(1) is different than px(4) ? — 5
  I dont understand why the probability of having a 1 is much higher than the probability of having a 4 lets...
- Where can I ask about where did my caluclation go wrong? — 9
  I got the final attempt wrong and would really like to know what went wrong; but if I discuss it here woul...
- Qa) is a bit tricky — 2
  I overcooked question a) and failed for the first 2 attempts. Please don't overthink!
- first roll or rolling a one — 10
  Are we talking about the roll landing on 1 or 2.5? Or are we talking about getting 2 or 3 on roll 1, and roll...
- sadness — 5
  I messed up. I wasn't careful and accidentally used the wrong power on my final attempt even though I ...
- Shouldn't p(2.5) be undefined? — 7 new — 10