

Name Answers

Finite Mathematics (Math 10120), Spring 2020

Quiz 5 Monday, April 6, 2020

1. Bruno has a box with 4 red balls and 6 blue ones. He randomly draws two balls (without replacement). Let X be the random variable that counts the number of red balls that he draws. Find the probability distribution for this random variable. For your answers I would like actual fractions, not using combination notion. (E.g. instead of $\frac{1}{C(7,2)}$ I'd like you to put $\frac{1}{21}$. You don't have to write a decimal equivalent, but you can if you want to.)

x_i	$P(X = x_i)$
0	$\frac{1}{3}$
1	$\frac{8}{15}$
2	$\frac{2}{15}$

$$P(X=0) = \frac{C(6,2)}{C(10,2)} = \frac{15}{45} = \frac{1}{3}$$

$$P(X=1) = \frac{C(4,1)C(6,1)}{C(10,2)} = \frac{24}{45} = \frac{8}{15}$$

$$P(X=2) = \frac{C(4,2)}{C(10,2)} = \frac{6}{45} = \frac{2}{15}$$

2. In some carnival game there are different amounts of money you can win, with the following probabilities:

x_i	p_i	$x_i p_i$
\$0	$\frac{2}{3}$	0
\$6	$\frac{1}{6}$	1
\$24	$\frac{1}{8}$	3
\$240	$\frac{1}{24}$	10
		<u>14</u>

If they want this to be a fair game, how much should they charge someone to play the game? For partial credit make sure you explain your answer.

the expected value is \$14, so to make it a fair game they should charge \$14. Anything less makes it advantageous to you to play.