Quiz 4

Form A Name _____

Math 130B, 5 PM

Please justify all your answers April 20, 2022

Please also write your full name on the back

1. Let X and Y be independent discrete random variables with probability mass functions given by

$$\Pr[X = x] = \frac{1}{n}, \quad \text{for } 1 \leq x \leq n$$
$$\Pr[Y = y] = 2^{-y}, \quad \text{for } y \geq 1.$$

(Here, x and y are integers)

(a) Find the joint probability mass function, $\Pr[X = x,\ Y = y]$.

(b) What possible values can the sum $Z = X + Y$ take?

(c) Find the probability mass function for $Z = X + Y$. *Be careful here. There are a couple of cases to consider.*

Quiz 4

Form B Name _____

Math 130B, 6 PM

Please justify all your answers April 20, 2022

Please also write your full name on the back

1. Let X and Y be independent random variables, both uniformly distributed on the set $\{0, 1, \ldots, n-1\}$, where n is a fixed positive integer.

   (a) Find the joint probability mass function, $\Pr[X = x,\ Y = y]$.

   (b) What possible values can the sum $Z = X + Y$ take?

   (c) Find the probability mass function for $Z = X + Y$. *Be careful here. Are some sums more likely than others?*