Draw one number at random from the following set, and let X be the value of the number that you draw.

$\{-2, -1, 0, 2\}$

1. Write down the pmf of X.

2. Draw the graph of the cdf of X.

Suppose $X \sim \text{Poisson}(6)$, where X represents the number of students who earn an A+ in Stat 20, and $Y \sim \text{Poisson}(5)$ represents the number of students who earn an F in stat 20. Since our class is not curved, we can assume that these two quantities are independent.

3. What is the probability that *no one* fails Stat 20? Write an expression for this probability.

4. What is the probability that *at least* 10 students earn an A+ in Stat 20? Write an expression for this probability.

An American roulette wheel has 18 red, 18 black, and 2 green slots. On each spin, a white ball lands in one of the slots. Suppose you spin the wheel 50 times, and bet on red each time. Let X be the number of times you win in 50 plays.

5. What is name of the probability distribution of X, with its parameters?

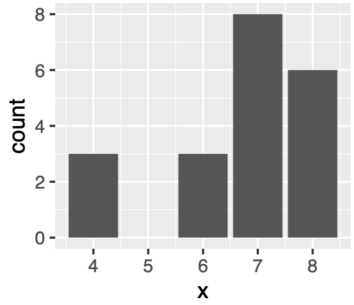
6. Write an expression for the probability that you win at least 12 times in the 50 spins.

7. Let Y be a random variable corresponding to the result (win or lose) of the twenty-fifth game. What is the probability distribution of Y, with its parameter(s)?

Consider a deck of 52 cards. Suppose we are interested in the random variable Z, which corresponds to the number of hearts dealt in a hand of seven.

8. What is name of the probability distribution of Z, with its parameters?

9. The following is a visualization which displays twenty draws from a mysterious random variable X.



- Name a plausible probability distribution based on the draws. Choose from the following three options: *Bernoulli*, *Binomial*, *Poisson*.

- Give a plausible value(s) of the parameter(s) of the probability distribution you chose above.