lab44

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1

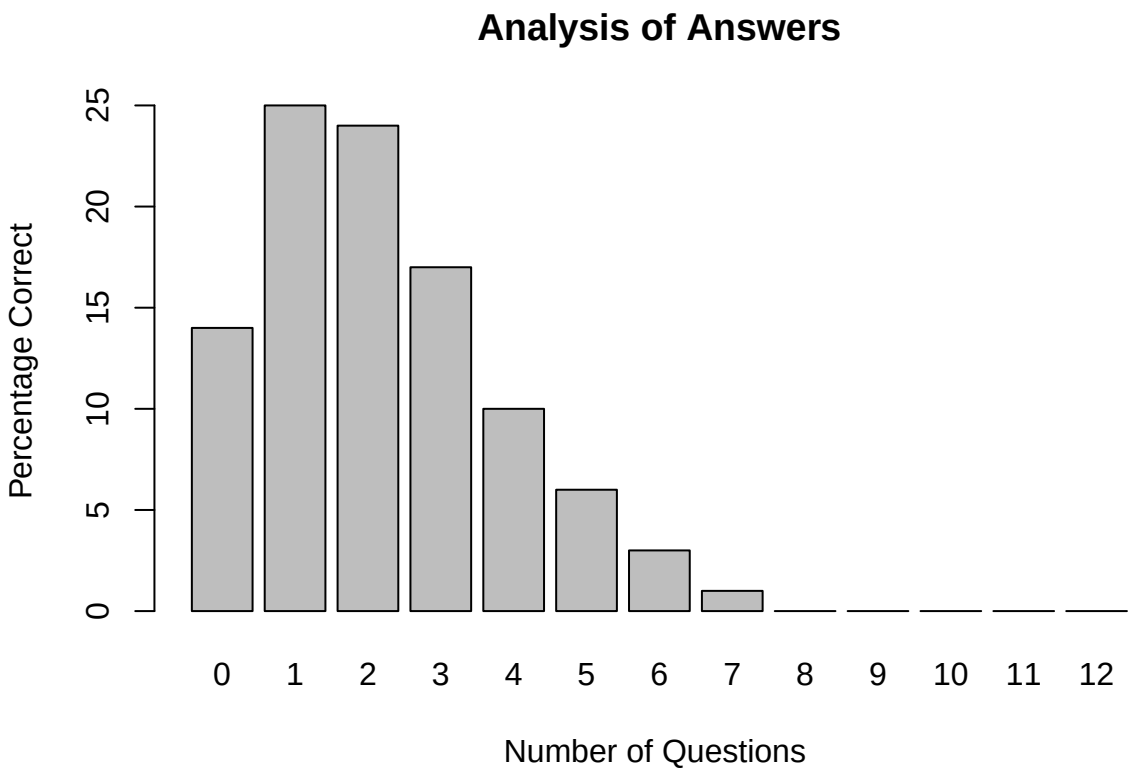
In R, create a numeric vector containing these percentages, and then use the barplot command to create

a graph of the distribution of "number correct." Make sure the graph axes are labeled correctly, and

add an explanatory title.

```
number_correct <- c(.14, .25, .24, .17, .1, .06, .03, .01, 0, 0, 0, 0, 0)
answers <- c(0:12)
number_correct <- number_correct * 100

barplot(number_correct ~ answers,
        horiz = FALSE,
        main = "Analysis of Answers",
        ylab = "Percentage Correct",
        xlab = "Number of Questions ")
```



2

Describe the shape of the graph you obtained

The graph above is heavily skewed to the right, meaning correct answers are hard to come by. It is so hard in fact that nearly 75% of all correct answers only answered 1/3rd of the answers correctly.

3

A

If there are 12 questions, each with three options, and the chimpanzees really do choose randomly,

the number of correct responses X should be described by a binomial probability distribution.

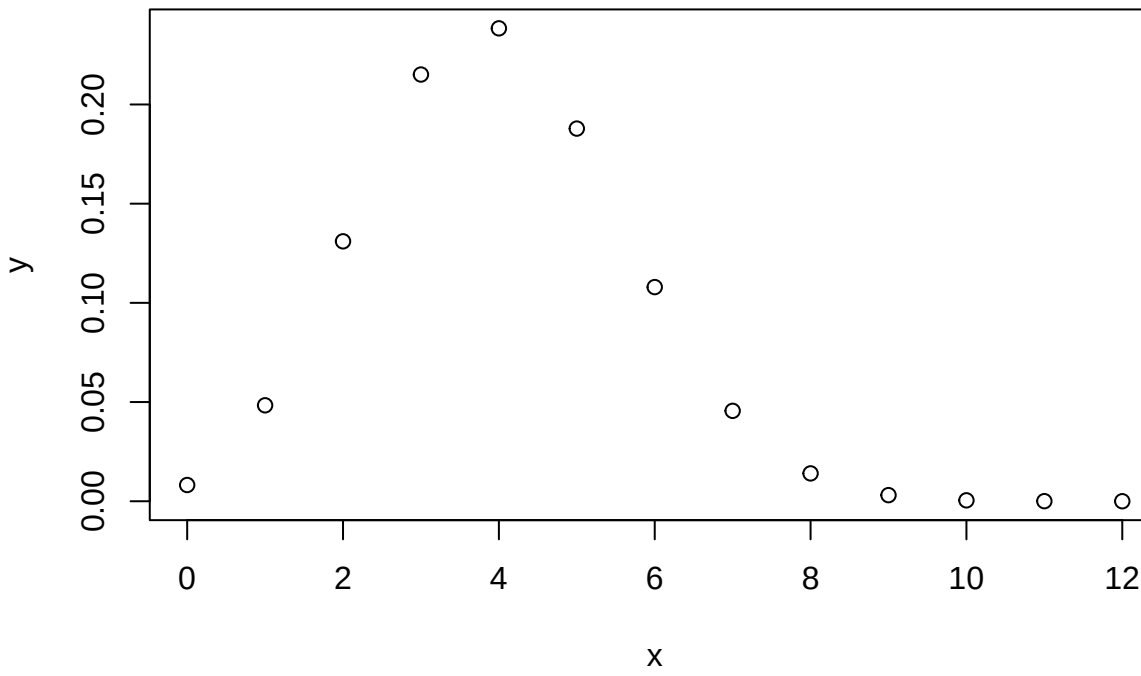
Indicate the values of n and p for this binomial distribution. P = .33 because there is a 1 in 3 chance the Chimp selects the correct answer N = 12

B

Use the dbinom function to create a new vector of probabilities reflecting the chimp's expected

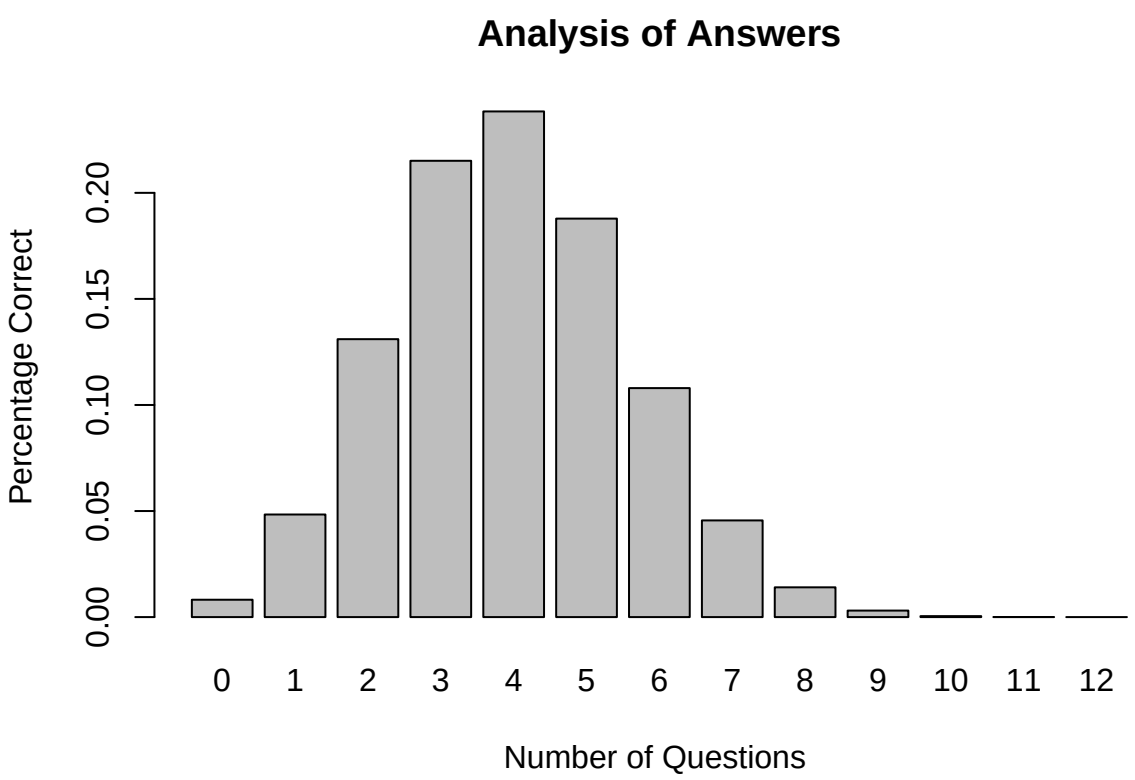
performance on the quiz. As in Question 1, plot the probability that a chimp will get every-where

```
x <- seq(0, 12, by = 1)
y <- dbinom(x, 12, 0.33)
plot(x, y)
```



from 0 to 12 correct.

```
barplot(y ~ x,
        horiz = FALSE,
        main = "Analysis of Answers",
        ylab = "Percentage Correct",
        xlab = "Number of Questions ")
```



C

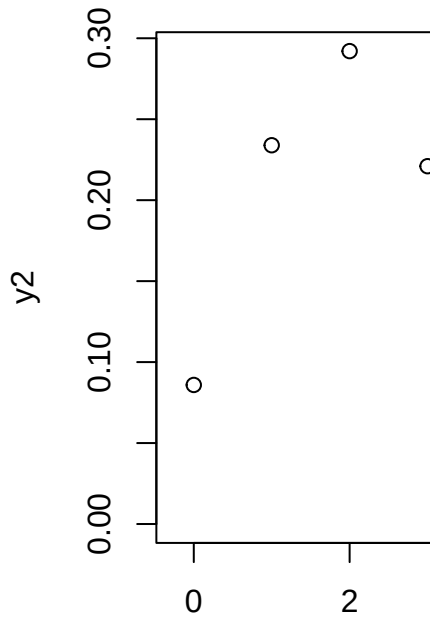
Describe how humans compare to chimps by comparing distribution center, spread and shape in your answer. Humans skewed right to the extreme.Chimps have a slight right skew. Humans somewhat followed the normal distribution/bell curve. Chimps followed the normal distribution/.bell curve Humans center at 2. Chimps center at 4 (.33 * 12).

4

A

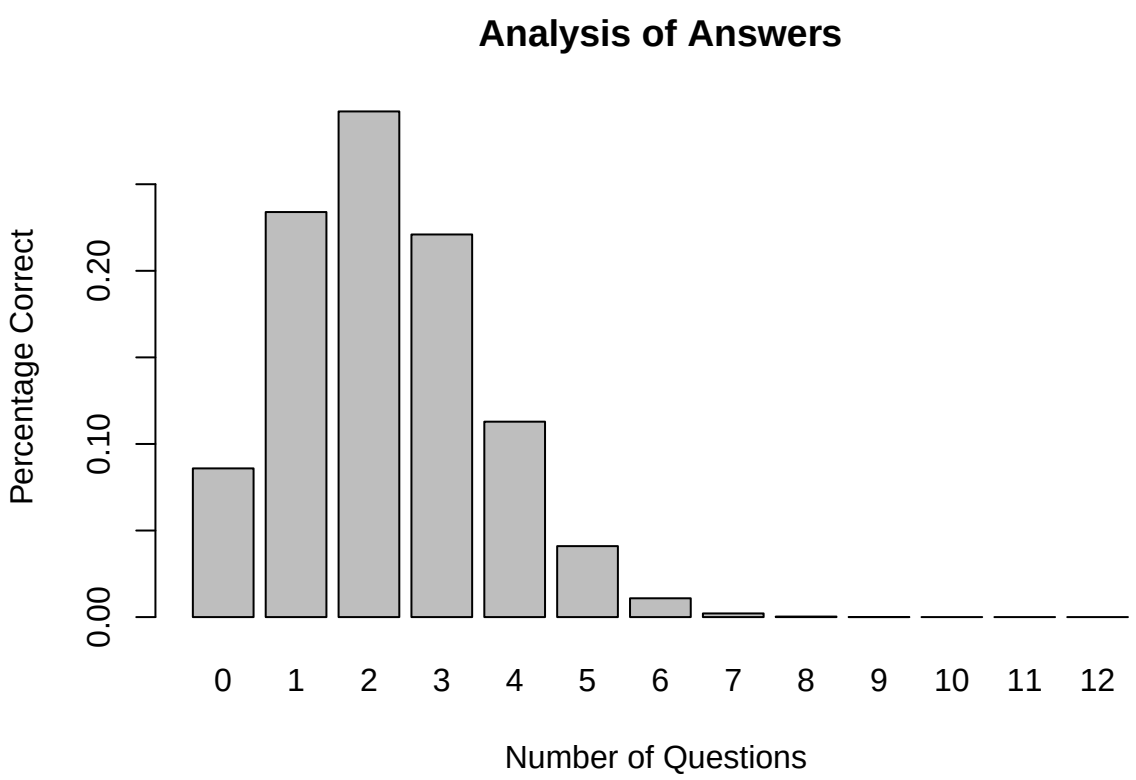
Use the dbinom command again to create a barplot of the expected distribution of correct human

```
x2 <- seq(0, 12, by = 1)
y2 <- dbinom(x, 12, 0.185)
plot(x2, y2)
```



answers, if human responses were also described by a binomial distribution.

```
barplot(y2 ~ x2,
        horiz = FALSE,
        main = "Analysis of Answers",
        ylab = "Percentage Correct",
        xlab = "Number of Questions ")
```



B

Write code that uses the pbinom() function to calculate $P(X > 4)$ for the binomial description of

```
a <- pbinom(12, 12, .185)
b <- pbinom(5, 12, .185)
c <- a - b
c
```

the number of correct human responses.

```
## [1] 0.01329958
```