Psyc 3101, Homework 6

The deer in Chautauqua spend each morning in one of three groves, but there doesn't seem to be any pattern to where they'll be each day. When I take my dog out in the morning, he races into the trees, hoping to find deer. I wonder whether Rufus is guessing randomly which grove to run to, or whether he can smell or hear them from across the field. So, I write down whether he finds deer each day:

Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day 11	Day12	Day 13	Day 14
Yes	Yes	No	Yes	No	Yes	No	Yes	No	Yes	Yes	No	Yes	Yes

Use these data to do a binomial test of whether Rufus can smell the deer or is just guessing.

1. What parameter are we trying to make a conclusion about? (Write the *meaning* of the parameter, not its mathematical symbol.)
The probability he will find the deer on any given day

2. Write a sentence stating the null hypothesis at a conceptual level.
He is guessing; his probability of finding deer is 1/3 every day.

3. Write the null hypothesis mathematically (i.e., as an equation).
$q = 1/3$

4. Write a sentence stating the alternative hypothesis at a conceptual level.
He's not just guessing; his probability of finding deer each day is different from (or greater than) 1/3.

5. Write the alternative hypothesis mathematically.
$q > 1/3$ or $q \neq 1/3$

6. What test statistic will you use to decide between the hypotheses?
Frequency of finding deer, *f*(Yes)

7. What is the value of this statistic for the sample I recorded?
9

Here's the distribution for the test statistic you should have written for Question 6, according to the null hypothesis. This is a binomial distribution based on $n = 14$ and q equal to what you should have written above.

Frequency:	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Probability:	.00	.02	.08	.16	.21	.21	.16	.09	.04	.01	.00	.00	.00	.00	.00

8. What is the critical value, assuming $\alpha = 5\%$?
Between 7 and 8

9. Which hypothesis do the data support?
Alternative hypothesis

10. Why?
He found deer more often than we would expect if the null hypothesis were true

11. Write a sentence summarizing your conclusion. This should be a sentence about Rufus, not about statistics.
Rufus can smell deer from across the field.