A recent national study showed that approximately 44.7% of college students have used Wikipedia as a source in at least one of their term papers. Let X equal the number of students in a random sample of size n = 31 who have used Wikipedia as a source. Perform the below operations:

a. Find the probability that X is equal to 17

```
dbinom(17,size = 31,prob = 0.447)
[1] 0.07532248
```

b. Find the probability that X is at most 13

```
pbinom(13,size = 31,prob = 0.447)
[1] 0.451357
```

c. Find the probability that X is bigger than 11.

```
pbinom(11,size = 31,prob = 0.447,lower.tail = F)
[1] 0.8020339
```

d. Find the probability that X is at least 15.

```
pbinom(14,size = 31,prob = 0.447,lower.tail = F)
[1] 0.406024
```

e. Find the probability that X is between 16 and 19, inclusive

```
sum(dbinom(16:19,size = 31,prob = 0.447))
[1] 0.2544758
```