D4

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3.4.1

    a. 0.0081
    b. 0.0081
    c. They are all the same
    d. 6

3.4.2

    a. The variables are not independent
    b. There is not a fixed probability of success in each trial
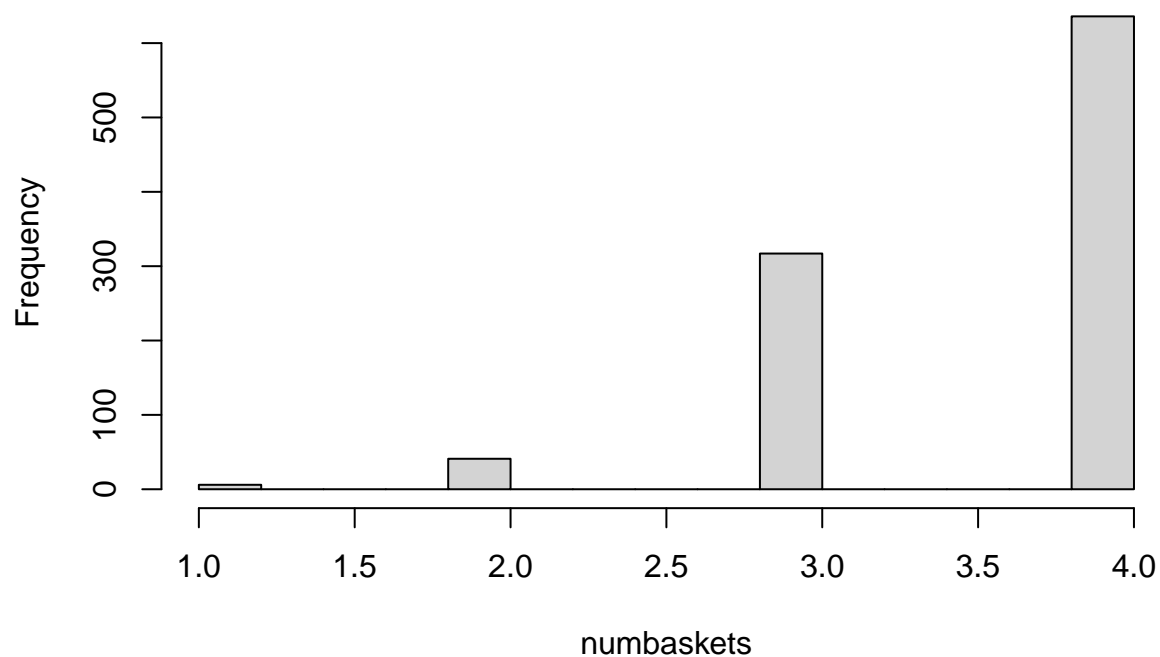   c. Does not have a fixed number of trials

3.4.3

    a. 0.0468
    b.

```r
numbaskets = rep(0, 1000)

freethrows=4
p=0.9

for(i in 1:freethrows){
  numbaskets=numbaskets+sample(c(1, 0), 1000, replace = TRUE, prob = c(p, 1-p))
}
hist(numbaskets)
```

Histogram of numbaskets


```r
print(freethrows)
```

```
## [1] 4
```

  c.

```r
length(which(numbaskets==2))
```
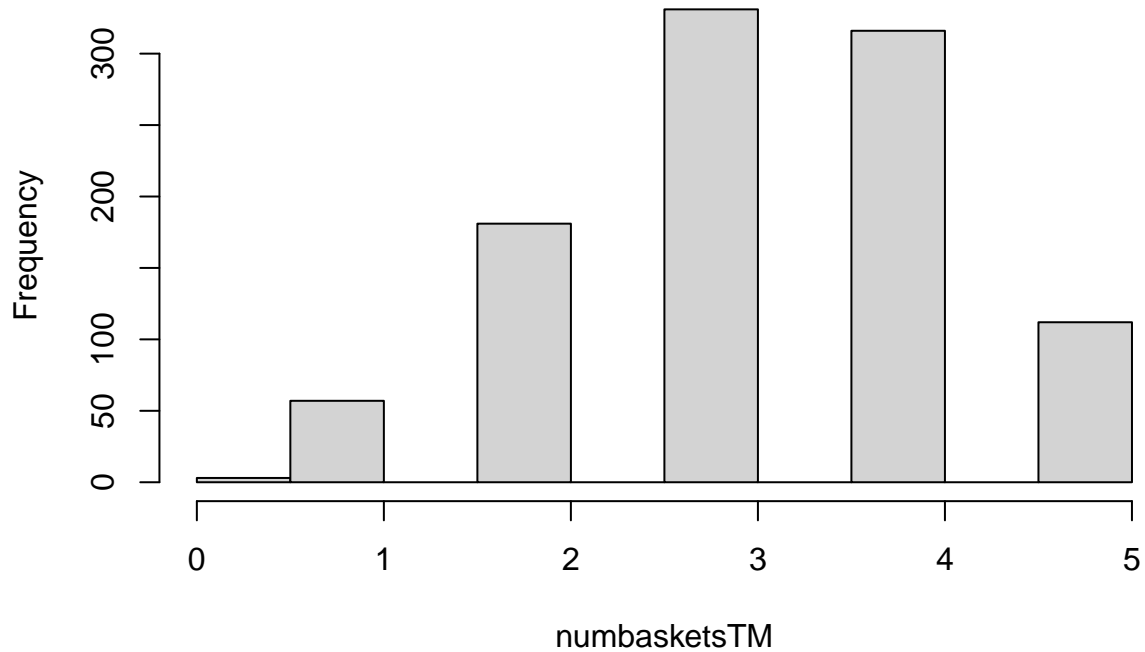
```
## [1] 41
```

It is very close d. 0.3369 e.

```r
numbasketsTM = rep(0, 1000)

freethrows=5
p=0.65

for(i in 1:freethrows){
  numbasketsTM=numbasketsTM+sample(c(1, 0), 1000, replace = TRUE, prob = c(p, 1-p))
}
hist(numbasketsTM)
```

Histogram of numbasketsTM


```r
print(freethrows)
```

```
## [1] 5
```

    f.

```r
length(which(numbasketsTM==3))
```

```
## [1] 331
```

This is very close to what I calculated

3.4.4 SKIP

3.4.5

a. A little less than 4.

b. $P(X = 0) = 0.001$ $P(X = 1) = 0.00015$ $P(X = 2) = 0.00405$ $P(X = 3) = 0.09$ $P(X = 4 = 0.6561$

c. $E(X) = np$ $E(X) = 4(0.9)$ $E(X) = 3.6$

d. $Var(X) = np(1-p) = 0.36$

e.

```r
mean(numbaskets)
```

```
## [1] 3.583
```

f.

```r
var(numbaskets)
```

```
## [1] 0.3614725
```

3.4.6 SKIP