# DExam

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## D1

1.

a.

```
pnorm(1.3, mean=0, sd=1)
```

```
## [1] 0.9031995
```

b.

```
pnorm(-0.7, mean=0, sd=1)
```

```
## [1] 0.2419637
```

c. 0.903 - 0.242 = 0.661
d. 1 - 0.903 = 0.097
e.

```
qnorm(0.28, mean=0, sd=1)
```

```
## [1] -0.5828415
```

f. 1 - 0.15 = 0.85
g.

```
qnorm(0.15, mean=0, sd=1)
```

```
## [1] -1.036433
```

h. 0.09 for both
i.

```r
qnorm(0.09, mean=0, sd=1)
```

```
## [1] -1.340755
```

## D2

2.

a. 43 homeruns above
b. 5.375 standard deviations
c. z-score = (x - mean) / standard deviation z = 5.375

```r
pnorm(5.375, mean=0, sd=1)
```

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

```r
pnorm(58, mean=15, sd=8)
```

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

3.

a.

```r
pnorm(20, mean=15, sd=8)
```

```
## [1] 0.7340145
```

1 - 0.734 = 0.266

b.

```r
qnorm(0.90, mean=15, sd=8)
```

```
## [1] 25.25241
```

c.

```r
pnorm(20, mean=15, sd=8)
```

```
## [1] 0.7340145
```

```r
pnorm(25, mean=15, sd=8)
```

```
## [1] 0.8943502
```

0.16

d.

```r
qnorm(0.05, mean=15, sd=8)
```

```
## [1] 1.841171
```

```r
qnorm(0.95, mean=15, sd=8)
```

```
## [1] 28.15883
```

k = 13.1588

## D3

4.

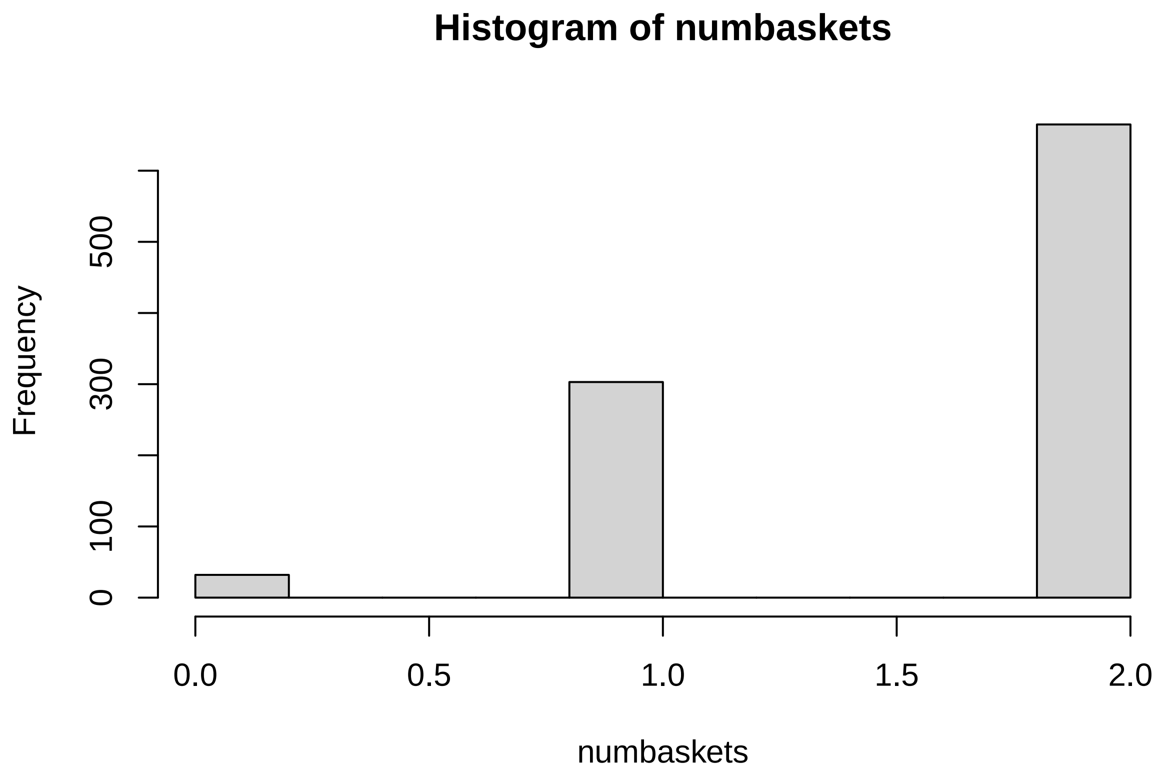
a. Assuming that you are picking a shirt for each day, so order matters, P(12, 7) = 12!/5! = 3991680
b. When buying ice cream, the order does not matter C(15, 4) = 1365
c. Order does not matter for when a card is in your hand C(52, 2) = 1326
d. Since there are 10 different people, order matters, since it determines who gets which card, so P(52, 10) = 5.7407 * 10^16

## D4

5.

a. 0.32
b.

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



freethrows=2

p=0.8



for(i in 1:freethrows){

  numbaskets=numbaskets+sample(c(1, 0), 1000, replace = TRUE, prob = c(p, 1-p))

}

hist(numbaskets)
```




```r
print(freethrows)
```

```
## [1] 2
```

c.

```r
length(which(numbaskets==1))
```

```
## [1] 303
```

This is very close to what I calculated

### D5

6.

a. E(X) = np
b. Var(X) = np(p-1)

7. Binomial distributions and Normal distributions appear very similar, they are not directly related but sometimes can be used to approximate the other.