1717719

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Answers:

1. $C\binom{17}{14} \times (0.8)^{14} \times (1-0.8)^{17-14} = 0.2393$

```
P <- 0.8; N <- 17; X <- 14
choose(N, X) * P ^ X * (1-P) ^ (N-X)
```

```
## [1] 0.2392537
```

2. $C\binom{17}{14} \times (0.8)^{14} \times (1-0.8)^{17-14} + C\binom{17}{15} \times (0.8)^{15} \times (1-0.8)^{17-15} + C\binom{17}{16} \times (0.8)^{16} \times (1-0.8)^{17-16} + C\binom{17}{17} \times (0.8)^{17} \times (1-0.8)^{17-17} = 0.5489$

```
dbinom(14, 17, 0.8) + dbinom(15, 17, 0.8) + dbinom(16, 17, 0.8) + dbinom(17, 17, 0.8)
```

```
## [1] 0.5488762
```

3. $1-(C\binom{17}{14} \times (0.8)^{14} \times (1-0.8)^{17-14} + C\binom{17}{15} \times (0.8)^{15} \times (1-0.8)^{17-15} + C\binom{17}{16} \times (0.8)^{16} \times (1-0.8)^{17-16} + C\binom{17}{17} \times (0.8)^{17} \times (1-0.8)^{17-17}) = 1 - 0.5489 = 0.4511$

```
sum(dbinom(1:13, 17, 0.8))
```

```
## [1] 0.4511238
```

4. $P(X = x) = e^{-210} \times 210^{17}/17! = 5.3066e - 67$

```
X <- 17; LAMBDA <- 210
exp(-LAMBDA) * LAMBDA ^ X / factorial(X)
```

```
## [1] 5.306624e-67
```

5. $P(X = x) = e^{-30} \times 30^{17}/17! = 0.0034$

```
dpois(17, 30)
```

```
## [1] 0.003397491
```

THE END