**3.** Let Xi = number of hours that two AAAA batteries will power the pointer and let Sn = . From the data we know that n = 20, EXi = µ = 5 hours and σ = 0.5 hours. We want to find out the following probability:

P(S20 ≥ 105)

From Central Limit Theorem:-

≈ Normal (nµ, nσ2)

Thus,

P(S20 ≥ 105) = 1 − P(S20 ≤ 104)

≈ 1 − pnorm(104, 100, √ 5) #Using CLT

= 0.03681914

**4.**

**a)** Let X be the random number equal to 1,2,3,4,5,…59

Given that 5 has been the most frequently occurring number last week hence we can say that 23 is always in one of those 5 numbers drawn.

P(23 last week)= 5/59 (**Equal**)

We can assume this to be normal distribution with ϻ= 23

Hence Probability of drawing 23 next week will be same or equal

P(drawing 23 next week)= 5/59

**b) False**, Though Oakland A wins first 6 games but it does not change their probability of winning remaining games which is (81/162). Probability of winning remaining matches is (81/162)156 hence claim is false.

**c) False,** If Oakland A has won first 6 games then remaining 156 games will be won with same probability which is 0.5. hence we can say that Oakland A’s wins 78 of remaining 156 games based on their probability hence Oakland A’s might end up winning (78+6)= 84 games this season.

**d)** **False,** From Central limit Theorem, We can say that Expected value of household incomes follow normal distribution Ẍ but does not tell anything about distribution of population value.

**e) False,** From Central limit Theorem, We can say that Expected value of household incomes follow normal distribution Ẍ.On doing survey multiple times and collecting Ẍ in all survey we can see that Ẍ follows normal distribution curve with E[Ẍ]= ϻ.