

# Math 365: Online Guidance (**Chalk Board**)

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Spring 21

# 1 Frist Week

Statistics is the scientific application of mathematical principles to the collection, analysis, and presentation of numerical data. Statisticians contribute to scientific enquiry by applying their mathematical and statistical knowledge to the design of surveys and experiments; the collection, processing, and analysis of data; and the interpretation of the results.

Another point about the nature of statistics as a science is that it is **not a deterministic science**. It does not have laws like force is equal to mass times acceleration. Statements in statistics come with a probability (i.e., quantified chance) of being correct. When a weatherman says that it will rain today he means that there is, say, a ninety five percent chance that it will rain today. Roughly, this means that if he makes the same

prediction one hundred times he will be correct 95 times, and it will not rain the other 5 days. The problem is that sometimes a weatherman will hide the information that there is a 95 percent chance only. Such information hiding is sometimes done for simplicity.

Skepticism:

**Descriptive and Inferential Statistics:** In this course we will be talking about two branches of statistics. The first one is called descriptive statistics which deals with methods of processing, summarizing, and presenting data. The other part deals with the scientific methods of drawing inferences and forecasting from the data, and is called inferential or inductive statistics.

1. Chapter 1 and 2: Descriptive Statistics. TI-84 (Silver Edition) would be used to solve problems.
2. . Chapter 3, 4, 5, 6: Probability and Mathematical Basis. There is no direct TI-84 method for these lessons. However, after explaining the mathematics involved, the DISTR key (menu) of TI-84 (Silver Edition) will be used to compute probability.
3. Chapter 7, 8, 9: Inferential Statistics or Estimation. The goal of this course is to develop methods to do estimation, which would be accomplished in these lessons. Again, DISTR key (menu) of TI-84 (Silver Edition) will be used heavily.

## Population and Sample

Mean GPA of KU student population

Variables

Numerical variables, same as quantitative variables

Non Numerical variables, same as qualitative variables

## Parameters and Statistics

We will be estimating parameters,  
using statistics (to be computed from samples)

### 1.1 Thursday

We also did the following:

1. **Variables** - quantitative and qualitative
2. Most Importantly, we discussed **Frequency Tables**

Today, we start with **Pictorial representation** of data.

1. Pie chart
2. **Histogram**, of frequency tables.
3. We comment on the **Bell curve**
4. If you use relative frequency table, **its histogram has total are 1.**
5. Cumulative frequency.

We move on to Chapter 2.

1. Data size
2. Mean
3. Weighted mean
4. Measure of dispersion

**Week Two** Feb 9

Tuesday

I mainly did  
Frequency Table  
Histograms

Mean , Median  
Mean Deviation, Variance  $s^2$  and St. Deviation  $s$

1. Chebyshev's Rule
2. Empirical Rule

Chapter 3

1. Set
2. Subset
3. Typo in page 44
4. Statistical (random) Experiment
5. Outcome or Sample point
6. Events
7. Typo in pp 26/33 "?"

**Thursday** I did the following:

1. Sample space
2. Events
3. Two special events: Impossible and Sure

4. Typo in pp. 48 Blood gr  
At most 4 eiders; 4 missing  
 $n(G)$ , not  $n(F)$   
dice problem in no 4  
Odd  
Probel 3.3. 1  $p(E \text{ or } G)$   
Problem 3.3.3.  $p(-)$

Answer part 3  
3.3. 6 = .85'

### Week 3

Tuesday: Feb 16: Class Cancelled because of power outage

### Thursday

1. (Refer to Ex. 3.4.1) You have Five slots:  
(ALLOW alphabets and Numerals)

36	36	36	36	36
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Answer= *Product* =

2. (Refer to Ex. 3.4.2) 231 Guests and 11 seats

231	230	229	228	227	226	225	224	223	222	221
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Answer

$$= \textit{Product} = \frac{231!}{(231 - 11)!} = {}_{231}P_{11}$$

**This is an ordered selection**

3. **Contrast:** Suppose you are dealt with a hand of 13 cards, out of a deck of 52. How many different hands of 13 is possible.

52	51	50	49	48	47	46	45	44	43	42	41	40
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Answer= *Product*?

No. In this kind of counting same 13 cards, received in different order is treated as distinct.

Actual game, they are not distinguishd.

**This is unordered selection**

$$= {}_{231}C_{11} = \frac{{}_{231}P_{11}}{11!} = \frac{231!}{(231 - 11)!11!}$$