

# Statistics Lecture 1



Feb 19-8:47 AM

[www.mymathclasses.com](http://www.mymathclasses.com)

- 1) Find Zoom link for office hours
- 2) Choose Your course, start exploring.
  - 1) Review the syllabus
  - 2) Do only the last page
  - 3) Submit that in Canvas.
- 3) Look for a section for study guides  
and that is where everything is.

You miss anything, there is no make-up

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Math Review:

$$1) \text{ Reduce } \frac{75}{120} = \frac{\cancel{5} \cdot 15}{\cancel{5} \cdot 24} = \frac{\cancel{3} \cdot 5}{\cancel{3} \cdot 8} = \boxed{\frac{5}{8}}$$

$$1) \frac{5}{8}$$

2) Convert .2% to

$$a) \text{ Decimal } .2\% = .2(.01) = \boxed{.002}$$

$$a) .002$$

$$b) \text{ Fraction } .2\% = \frac{.2}{100} = \frac{\cancel{2}}{1000} = \boxed{\frac{1}{500}}$$

$$b) \frac{1}{500}$$

3) 4% of 250 students were left-handed.

How many were left-handed?

$$4\% \text{ of } 250 = \frac{4}{100} \cdot 250 = \boxed{10}$$

$$3) 10$$

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Scientific Notation

$$N \times 10^n$$

$\uparrow$   $\nwarrow$   
 $1 \leq N < 10$  any integer

$$2.5 \times 10^{-6}, \quad 1.75 \times 10^{18}$$

Convert .0000865 to S.N.

$$8.65 \times 10^{-5}$$

Convert 375,000,000,000 to S.N.

$$3.75 \times 10^{11}$$

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Factorial !  $0! = 1$   
 $n!$   $n$ -Factorial  $1! = 1$   
 $n! = n(n-1)(n-2)(n-3)\dots 3 \cdot 2 \cdot 1$

$$4! = 4 \cdot 3 \cdot 2 \cdot 1 = \boxed{24}$$

$$6! - 5! = \underbrace{6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1}_{720} - 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1_{120} = \boxed{600}$$

Simplify  $\frac{7!}{5! \cdot 2!} = \frac{7 \cdot \cancel{6} \cdot \cancel{5} \cdot 4 \cdot 3 \cdot 2 \cdot 1}{\cancel{5} \cdot \cancel{4} \cdot 3 \cdot 2 \cdot 1 \cdot 2 \cdot 1}$   
 $= \frac{21}{1} = \boxed{21}$

Use Your Calc to Simplify

$$\begin{array}{l} \text{TI-83} \\ \text{TI-84} \end{array} \quad \frac{8(72) - 27^2}{8(8-1)} = \frac{576 - 576}{8(7)}$$

$$\boxed{\text{Do not use } \emptyset \text{ for } 0.} \quad = \frac{0}{56} = \boxed{0}$$

Simplify  $\frac{48-32}{\frac{10}{\sqrt{4}}} = \frac{16}{\frac{10}{2}} = \frac{16}{5} = \boxed{3.2}$

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Use Your Calc to Simplify

$$1.96 \cdot \sqrt{\frac{(.8)(.2)}{25}} = 1.96 \cdot \sqrt{\frac{.16}{25}}$$

$$= 1.96 \cdot \sqrt{.0064}$$

$$= 1.96 \cdot (.08) = \boxed{.1568}$$

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A deck of cards has 40 cards with  
6 face cards.

what % of cards are face cards?

6 is what % of 40?

$$\frac{6}{40} \cdot 100 = \boxed{15}$$

15%

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$$y = 2.5x - 20$$

Find  $y$  when  $x$  is 8?

$$y = 2.5(8) - 20 = 20 - 20 = 0$$

0

Find  $x$  when  $y$  is 20?

$$20 = 2.5x - 20$$

$$20 + 20 = 2.5x$$

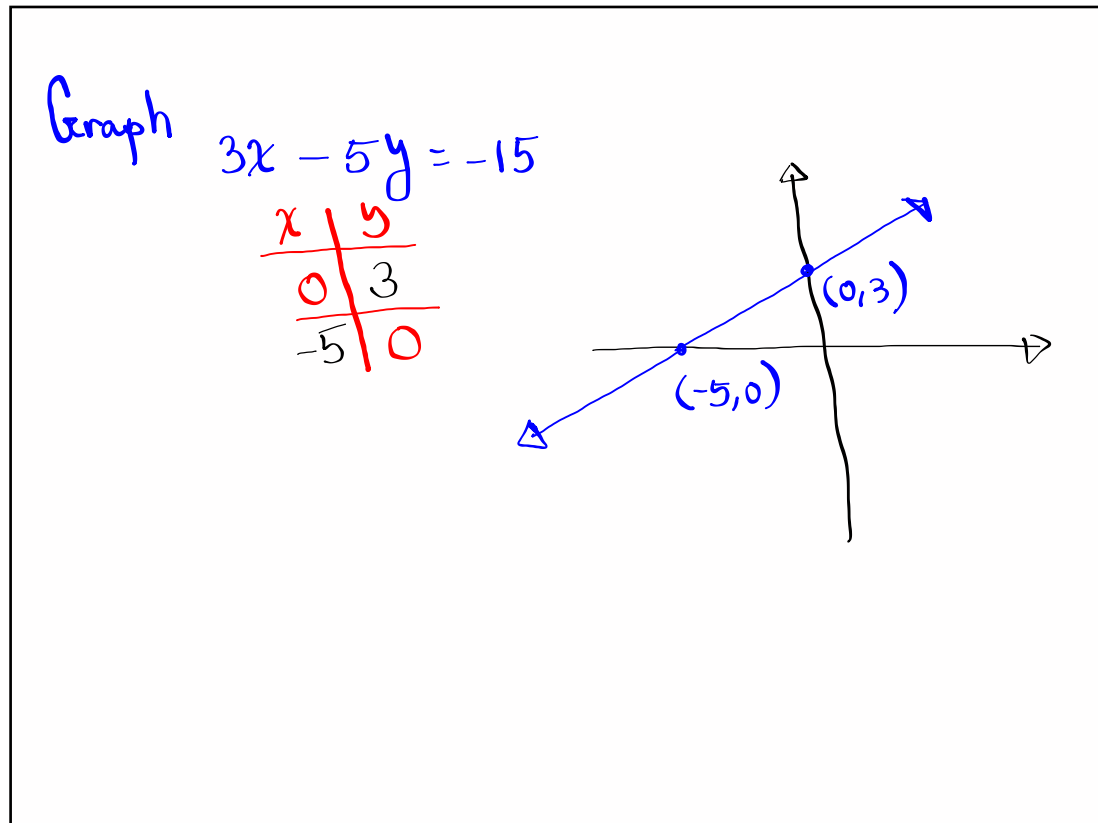
$$40 = 2.5x$$

$$x = \frac{40}{2.5}$$

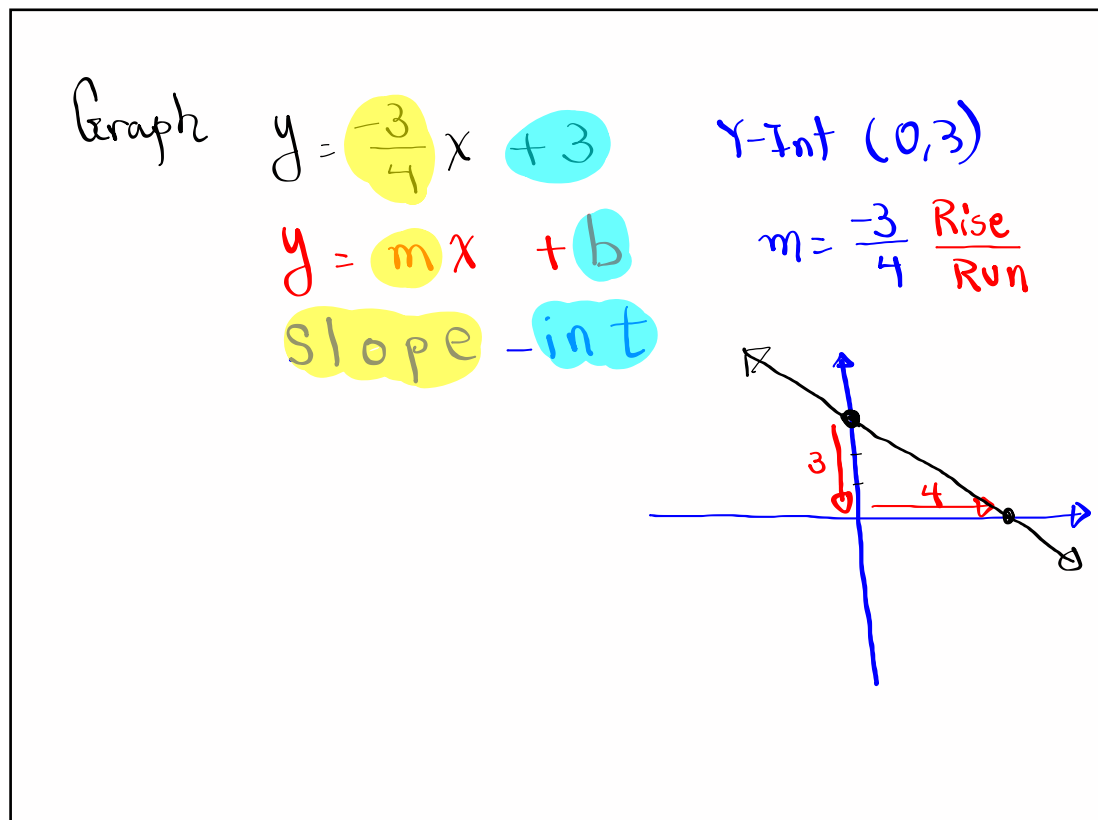
$$\boxed{x=16}$$

16

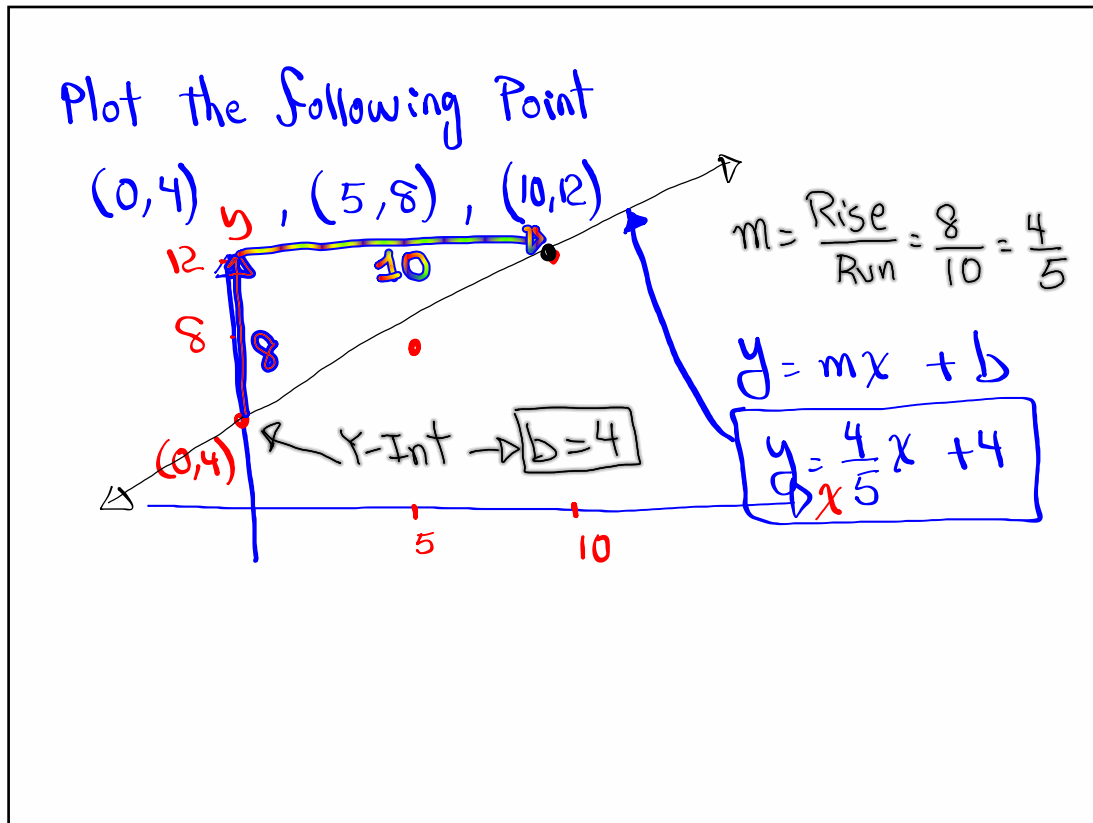
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I Surveyed 100 people in L.A.

- 20 were fan of Lakers and Rams
- 40 were fan of only Lakers
- 10 " " = only Rams.

The rest were not fan of either team.

Organize this in a Venn Diagram.

Total=100

**SG 1**  
4 pages

Make one file  
Pages in order  
in Portrait style.

You Submit  
in Canvas.

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SG 2

What is Statistics?

It is about collecting information (data),  
organize, summarize, graph, do  
certain computations, and draw  
conclusion.

Two Branches:

1) Descriptive : working with collected  
data, graph, computation

2) Inferential : To use descriptive  
statistic to make  
meaningful predictions.

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Population  $\Rightarrow$  Entire field of interest

Keyword : All , every

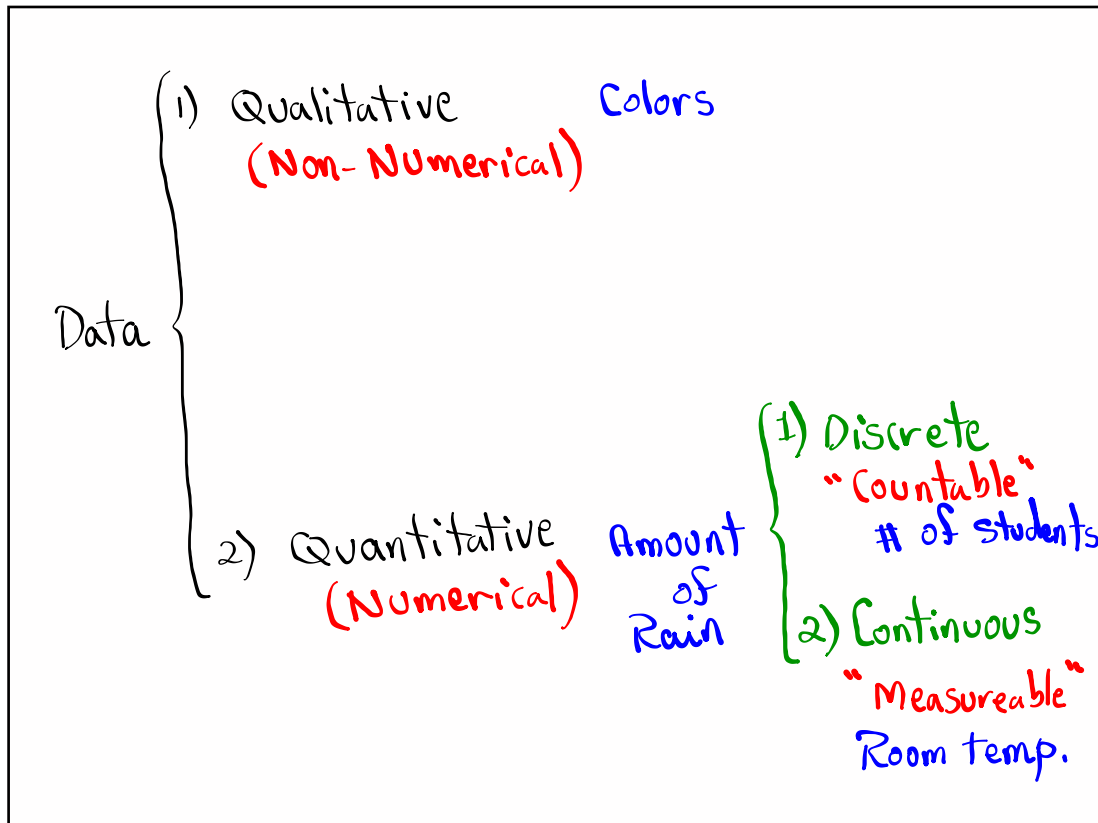
Sample  $\Rightarrow$  Randomly selected data from  
Population

Keyword : few , randomly selected

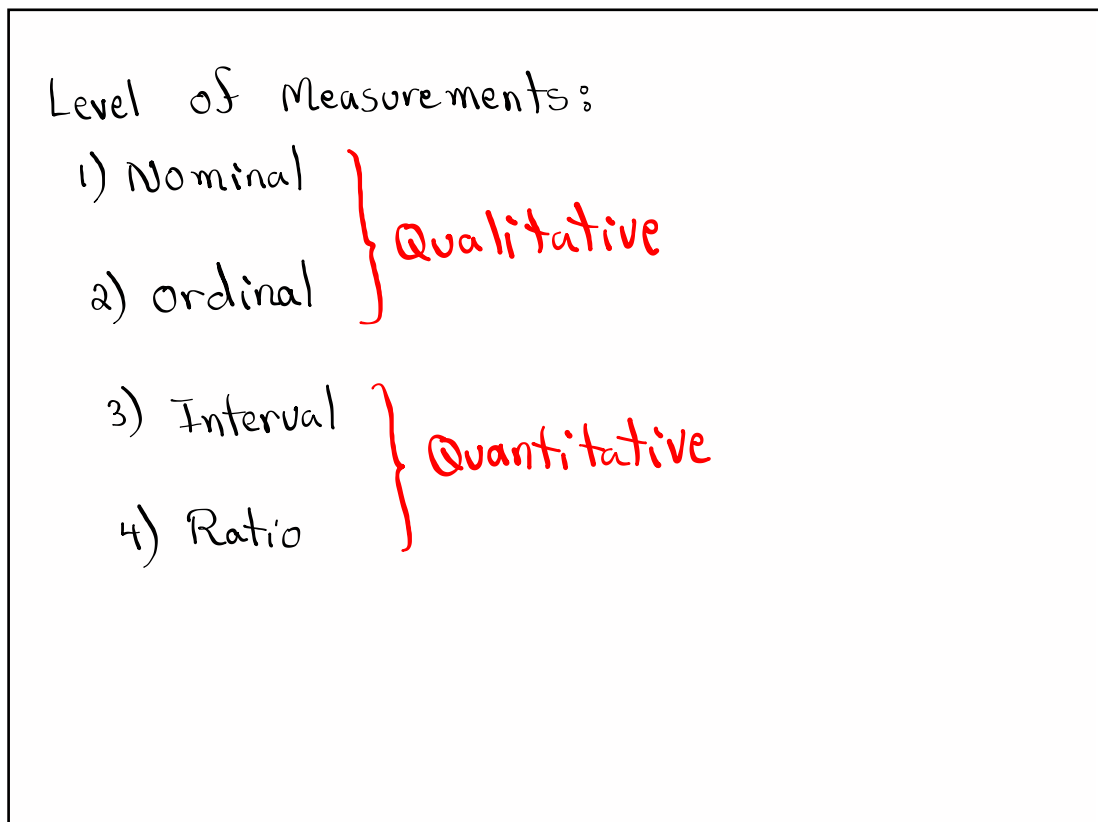
Population  $\leftrightarrow$  Parameter

Sample  $\leftrightarrow$  Statistic

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**Nominal** : No values, Order is not meaningful

Colors : Red, white, Blue

Yes, NO responses

Jersey number on back of players

**Ordinal** : are nominals but order is meaningful

Grades, Movie ratings  
 very good  
 good  
 bad  
 very bad

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**Interval** : Range of values  
 perform + or - operation.

90 - 100 → A

80 - 89 → B

⋮

**Ratio** : Numerical with meaningful Ratio

Me: 30 Years, Lisa: 10 Years

Ratio 3 to 1

Doctor's Salary vs Nurse's Salary

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Sampling Method:

1) **Systematic**  $\Rightarrow$  every  $k$ th item Selected

They record every 5th call.

Every 10th item on assembly line Selected for inspection.

2) **Stratified**: Divide into groups,  
Select few from each group

12 Males  $\rightarrow$  Select 5 males

20 Females  $\rightarrow$  Select 8 Females

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3) **cluster**: Divide into groups

Select few groups

Collect data from all members of  
Selected groups.

College offered 200 Sections of classes  
in winter 2024.

40 Sections were randomly Selected

All students were asked to do a Survey.

At a local Univ., I randomly Selected

100 Freshmen, 150 Sophomore, 75 jrs., 25 Srs., and

50 graduate students to do a Survey  
**stratified**

Random or Convenience

Least Reliable Method to Collect  
Data

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Observational Vs Experimental

↳ make  
↳ observation  
No attempt  
to modify it.

we do some  
treatment and  
observe the changes.

SG 2

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Consider the Sample below

2, 3, 4, 4, 8

1) Sample Size  $n = 5$

2) Min. = 2      Max. = 8

3) Range = Max - Min =  $8 - 2 = 6$

4) Midrange =  $\frac{\text{Max} + \text{Min}}{2} = \frac{8 + 2}{2} = 5$

5) Mode = 4

6)  $\sum x = 2 + 3 + 4 + 4 + 8 = 21$

Summation of  $x$

Summation of data elements

7)  $\sum x^2 = 2^2 + 3^2 + 4^2 + 4^2 + 8^2 = 109$

Square every data element, then add.

8) Compute  $\frac{n \sum x^2 - (\sum x)^2}{n(n-1)} = \frac{5 \cdot 109 - 21^2}{5(5-1)}$

$= \frac{104}{20} = 5.2$

9)  $\sqrt{\text{Last Answer}} = \sqrt{5.2} \approx 2.3$

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Consider the Sample below  
1, 3, 3, 3, 5

1)  $n = 5$

2) Min. = 1      Max. = 5

3) Range = Max - Min =  $\boxed{4}$

4) Midrange =  $\frac{\text{Max} + \text{Min}}{2} = \boxed{3}$

5)  $\sum x = 1 + 3 + 3 + 3 + 5 = \boxed{15}$

7) Mode =  $\boxed{3}$

6)  $\sum x^2 = 1^2 + 3^2 + 3^2 + 3^2 + 5^2 = \boxed{53}$

8)  $\frac{\sum x}{n} = \frac{15}{5} = \boxed{3}$

9)  $\frac{n \sum x^2 - (\sum x)^2}{n(n-1)}$

$= \frac{5 \cdot 53 - 15^2}{5(5-1)} = \frac{40}{20} = \boxed{2}$

10)  $\sqrt{\text{last answer}} = \sqrt{2} \approx \boxed{1.4}$

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Class QZ 1

1) What kind of calculator do you need for this class? **TI-83 or TI-84**

2) Beside Canvas, what is the name of the website that you can find the syllabus and study guides?

**www.mymathclasses.com**

3) Compute  $5^2 - 5 \cdot 2$   
 $= 25 - 10 = \boxed{15}$

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