

Math 110
Winter 2021
Lecture 1



Math 110

M - Th

2:45 - 4:50

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www.mymathclasses.com

Click on Math 110

Office hours

M - Th 7:30 PM - 8:30 PM

Fridays 12:30 - 4:00 PM

Basic Math review:

1) Reduce $\frac{75}{400} = \frac{\cancel{5} \cdot 15}{\cancel{5} \cdot 80} = \frac{\cancel{5} \cdot 3}{\cancel{5} \cdot 16} = \frac{3}{16}$

TI-83 or TI-84

1) $\frac{3}{16}$

2) write .5% to

a) decimal

$.5\% = .5(.01) = .005$

b) reduced fraction

$.5\% = \frac{.5}{100} = \frac{.5(10)}{100(10)} = \frac{\cancel{5}}{100(\cancel{10})^2} = \frac{1}{200}$

3) what is $\frac{8\%}{}$ of 250?

$x = .08(250) \quad x = 20$

4) write 735,000,000 in Scientific Notation.

7.35×10^8

$N \times 10^n$
 $\rightarrow 1 \leq N < 10$

5) write 6.8×10^{-8} in decimal notation.

0.000000068

6) Reduce $\frac{75 - 60}{\frac{8}{\sqrt{25}}} = \frac{15}{\frac{8}{5}} = \frac{15}{1} \cdot \frac{5}{8} = \frac{75}{8} = 9.375$

! Factorial

$$0! = 1$$

$$1! = 1$$

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

$$5! = 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 = 120$$

$$\begin{aligned} 7! + 3! &= 7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 + 3 \cdot 2 \cdot 1 \\ &= 5040 + 6 = \boxed{5046} \end{aligned}$$

$$\begin{aligned} \text{Simplify } \frac{8!}{2! \cdot 6!} &= \frac{\cancel{8} \cdot \cancel{7} \cdot \cancel{6} \cdot \cancel{5} \cdot \cancel{4} \cdot \cancel{3} \cdot \cancel{2} \cdot 1}{\cancel{2} \cdot 1 \cdot \cancel{6} \cdot \cancel{5} \cdot \cancel{4} \cdot \cancel{3} \cdot \cancel{2} \cdot 1} \\ &= \boxed{28} \end{aligned}$$

 n^C_r n Choose r

$$n^C_r = \frac{n!}{r! \cdot (n-r)!}$$

$$7^C_3 = \frac{7!}{3! \cdot (7-3)!}$$

find

$$9^C_4 = \frac{9!}{4! \cdot (9-4)!}$$

$$= \frac{9!}{4! \cdot 5!}$$

$$= \frac{\cancel{9} \cdot \cancel{8} \cdot \cancel{7} \cdot \cancel{6} \cdot \cancel{5}!}{\cancel{4} \cdot \cancel{3} \cdot \cancel{2} \cdot \cancel{1} \cdot \cancel{5}!} = 3 \cdot 7 \cdot 6 = \boxed{126}$$

$$\begin{aligned} &= \frac{7!}{3! \cdot 4!} \\ &= \frac{\cancel{7} \cdot \cancel{6} \cdot \cancel{5} \cdot \cancel{4}!}{\cancel{3} \cdot \cancel{2} \cdot \cancel{1} \cdot \cancel{4}!} = \boxed{35} \end{aligned}$$

A deck of Cards has 52 Cards, 26 Red,
4 Aces, and 12 Face Cards.

1) How many are not aces?

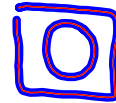
$$52 - 4 = \boxed{48}$$

2) How many are Aces or Face Cards?

$$4 \quad 12 \quad \Rightarrow 4 + 12 = \boxed{16}$$

3) How many are aces and Face Cards? Do not

Zero



use



Given $2x - 3y = 12$

Find x when $y = 4$

$$2x - 3(4) = 12$$

$$2x - 12 = 12$$

$$2x = 24$$

$$\boxed{x = 12}$$

Find y when $x = 6$

$$2(6) - 3y = 12$$

$$12 - 3y = 12$$

$$-3y = 0$$

$$y = \frac{0}{-3}$$

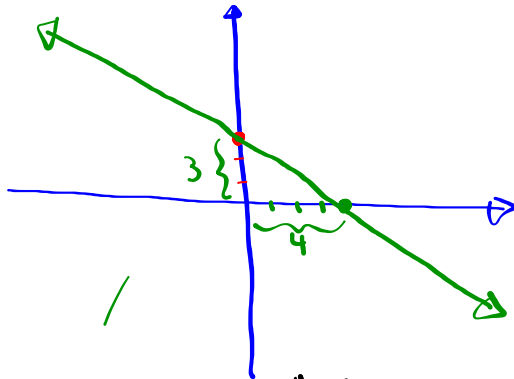
$$\boxed{y = 0}$$

Draw $y = -\frac{3}{4}x + 3$

$$y = mx + b$$

Y-Int (0,3)

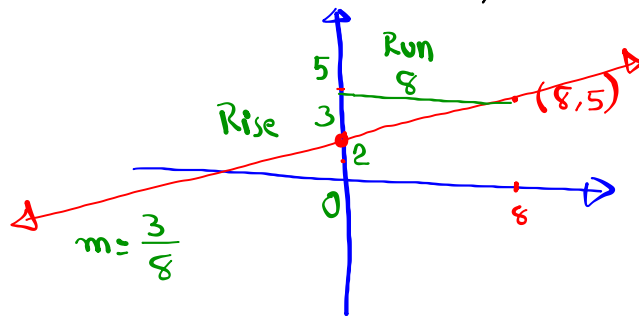
Slope $m = -\frac{3}{4}$



Plot A (0,2) and B(8,5), Draw AB, then find its equation

$$y = mx + b$$

$$y = \frac{3}{8}x + 2$$



80 students were surveyed.

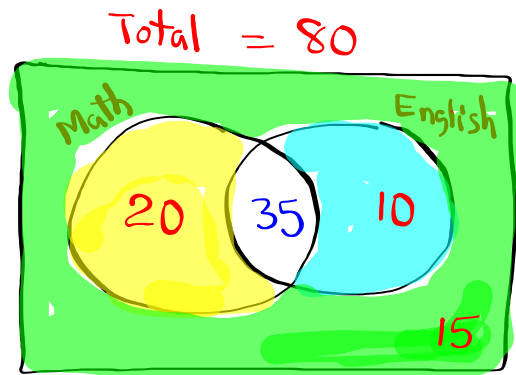
20 were taking Math only

10 " " English only

15 were taking neither.

Construct Venn Diagram

organize data



35 were taking both.

SG 1 ✓

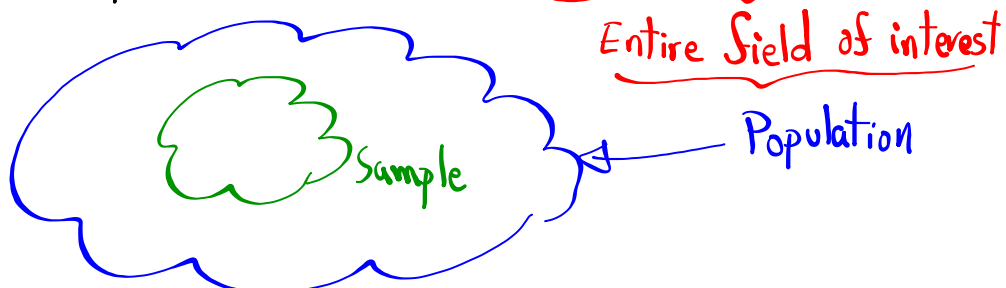
What is Statistics?

It is about collecting information, organize them, graph them, Do computations, learn from them to make predictions, and likely chances of Prediction to come true.

- 1) **Descriptive**: Collect data, organize & graph, do certain Computations
- 2) **Inferential**: When we draw Conclusion and make predictions.

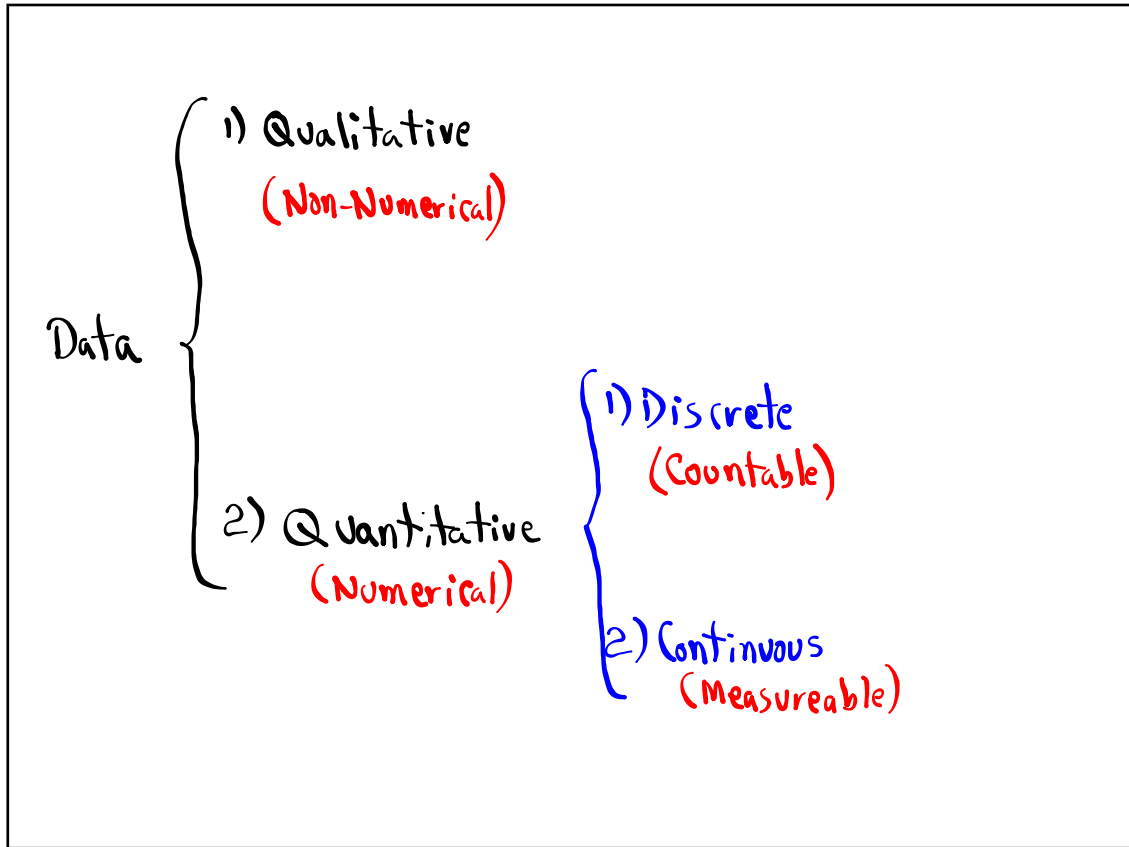
Collection of Data is to Form a Sample.

Sample is a part of larger field of interest.



Population \leftrightarrow Parameter

Sample \leftrightarrow Statistic



Level of measurements:

1) Nominal Red, white, Blue , Toyota, Nissan, Honda

2) Ordinal Small, Med, Large

3) Ratio Numerical Value
 12 oz, 16oz \Rightarrow 12:16 \Rightarrow 3:4 ^{Ratio}

4) Interval Range of Values
 90% - 100% \Rightarrow A

1oz - 99oz \Rightarrow \$8.75

Collect data:

- 1) Systematic : Select every k th item.
- 2) Stratified : Divide into groups, Select few from each group.
- 3) Cluster : Divide into groups, Select few groups, Collect data from all members of Selected groups.
- 4) Random / Convenience : Least reliable method.

I randomly Selected 250 Freshmen, 150 Sophomore, 100 Jr, 75 Sr, and 50 graduate students from Calpoly and did a Survey.

Name the method: Stratified.

Mt. SAC offered 2000 sections of classes in Fall 2020.

They randomly Selected 50 sections and ask all Students to do a Survey. Name the method: Cluster.

Manager at Customer Service selected every 8th Call to evaluate a new hire.

Name the method: Systematic