

Statistics

Lecture 1



Feb 19-8:47 AM

Some Math Review: TI-83 or TI-84

1) Simplify $\frac{55}{80} = \frac{\cancel{5} \cdot 11}{\cancel{5} \cdot 16} = \frac{11}{16}$

1) $\frac{11}{16}$

2) Convert .05% to

a) Decimal $.05\% = .05(.01) = \boxed{.0005}$

b) Reduced fraction $.05\% = .05 \cdot \frac{1}{100} = \frac{1}{100} \cdot \frac{1}{100} = \frac{1}{10000}$

2a) $\frac{.0005}{1}$

2b) $\frac{1}{2000}$

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I surveyed 500 students, and 4% of them were left-handed. How many were left-handed?

$$4\% \text{ of } 500 = \frac{4}{100} \cdot 500$$

$$= 4 \cdot 5 = 20 \quad \underline{20}$$

I surveyed 80 students and 10 of them were smokers. What % of them were smokers?

10 is what % of 80?

$$10 = \frac{P}{100} \cdot 80$$

Multiply by 100

$$100 \cdot 10 = P \cdot 80$$

$$\frac{1000}{80} = P$$

$$P = 12.5$$

$$\underline{12.5\%}$$

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Scientific Notation

$$N \times 10^n$$

$$1 \leq N < 10$$

$$5.2 \times 10^6$$

Pos. exp.

Large #

$$1.75 \times 10^{-3}$$

Neg. exp.

Small number

$$25,000,000 = 2.5 \times 10^7$$

↑
move
Right 7 places

$$3.45 \times 10^{-8} = \underbrace{0.00000000}_{8 \text{ zeros}} 3.45$$

$$= \boxed{0.0000000345}$$

↑
optional

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Use your Calc to evaluate

$$1) \frac{38 - 30}{\frac{10}{\sqrt{4}}} = \frac{8}{\frac{10}{2}} = \frac{8}{5} = \boxed{1.6}$$

$$2) \frac{10 \cdot 360 - 60^2}{10(10-1)} = \frac{3600 - 3600}{10 \cdot 9} = \frac{0}{90} = \boxed{0}$$

Do not use \emptyset for Zero.

$$3) 1.75 \cdot \sqrt{\frac{(.8)(.2)}{25}} = 1.75 \cdot \sqrt{\frac{.16}{25}}$$

$$= 1.75 \cdot \frac{.4}{5}$$

$$= \boxed{.14}$$

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! Factorial

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

$$5! = 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 = \boxed{120}$$

Simplify

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

$$= \frac{4 \cdot 7}{1} = \boxed{28}$$

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A deck of playing cards has 40 cards and
3 aces.

what % of them are aces?

3 is what % of 40?

$$\frac{3}{40} = \frac{P}{100}$$

Cross-Multiply

$$40P = 300$$

$$P = \frac{300}{40}$$

$$P = 7.5 \quad \underline{7.5\%}$$

Round to a whole %

8%

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Given $y = 5x - 12$

1) find y when $x = 2.4$

$$y = 5(2.4) - 12$$

$$= 12 - 12$$

$$= \boxed{0}$$

2) find x when $y = 24$

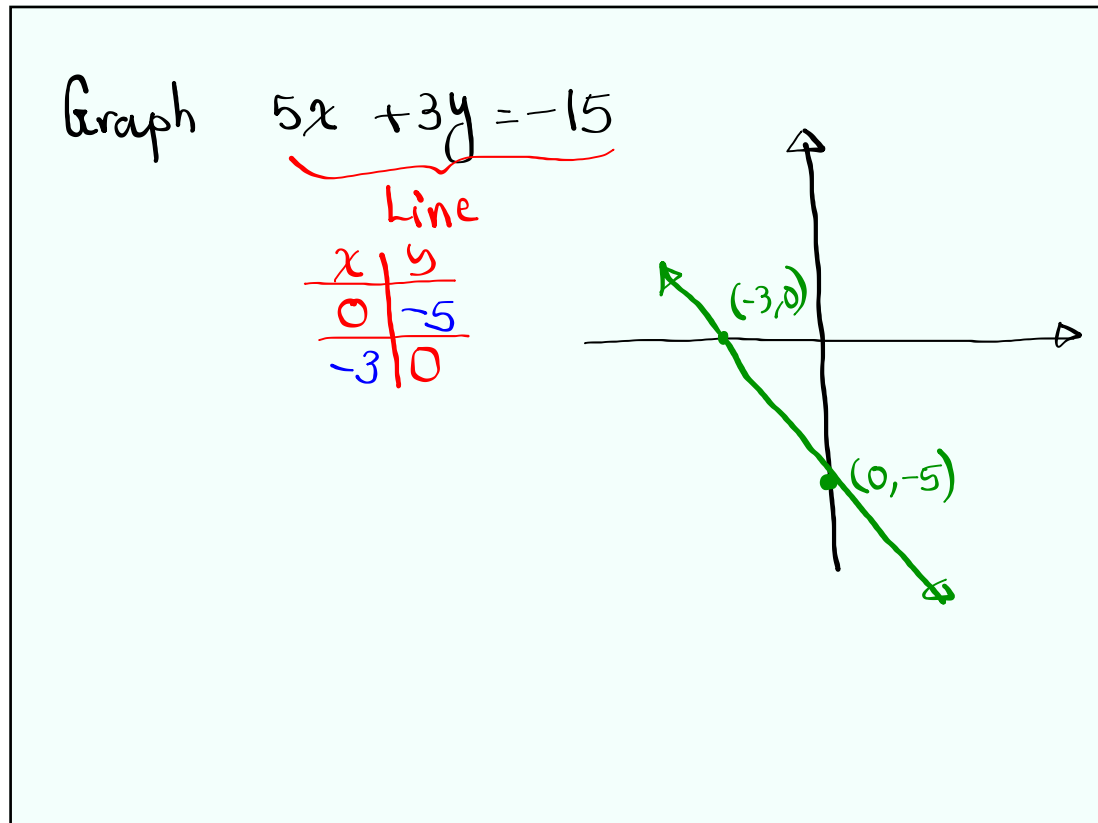
$$24 = 5x - 12$$

$$24 + 12 = 5x$$

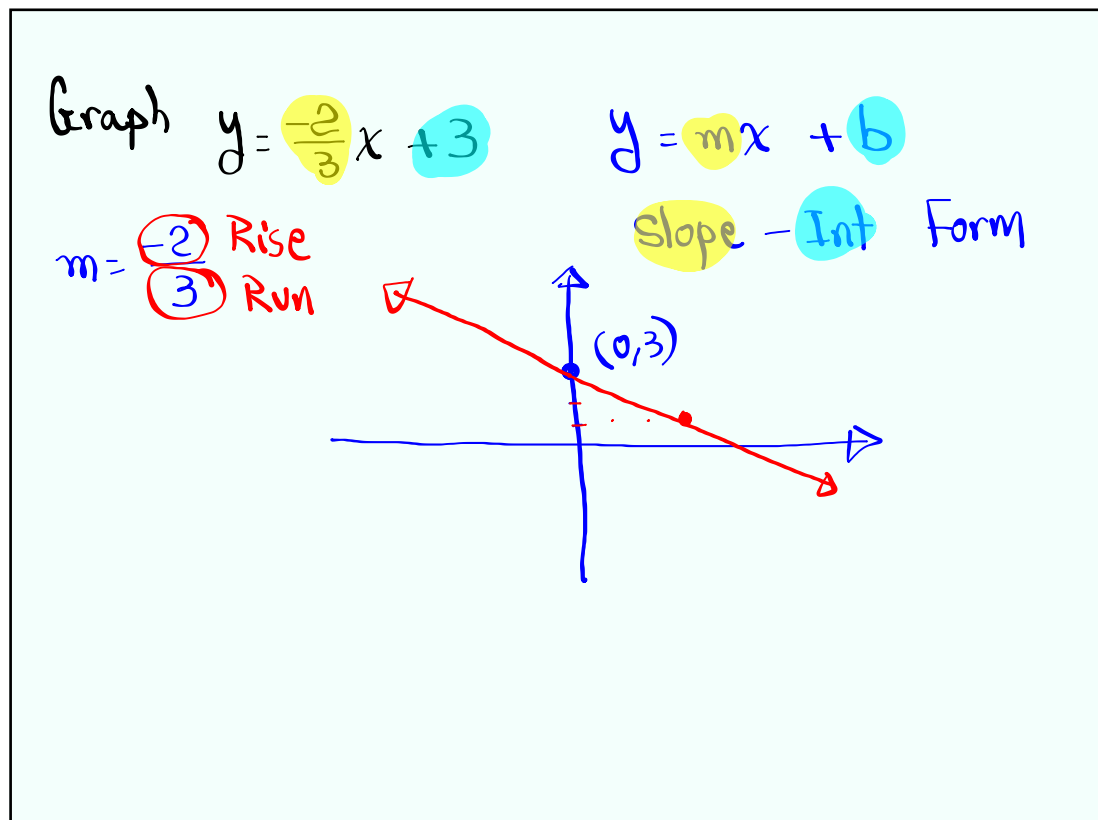
$$36 = 5x$$

$$x = \frac{36}{5} = \boxed{7.2}$$

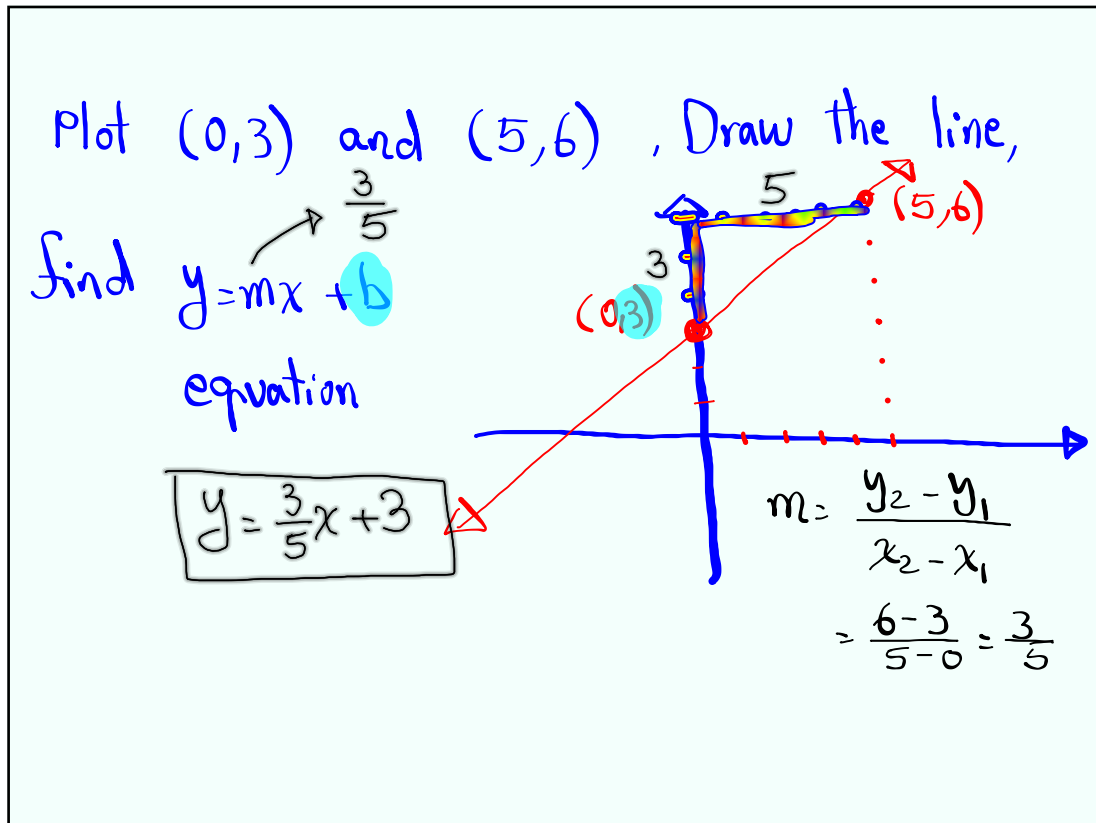
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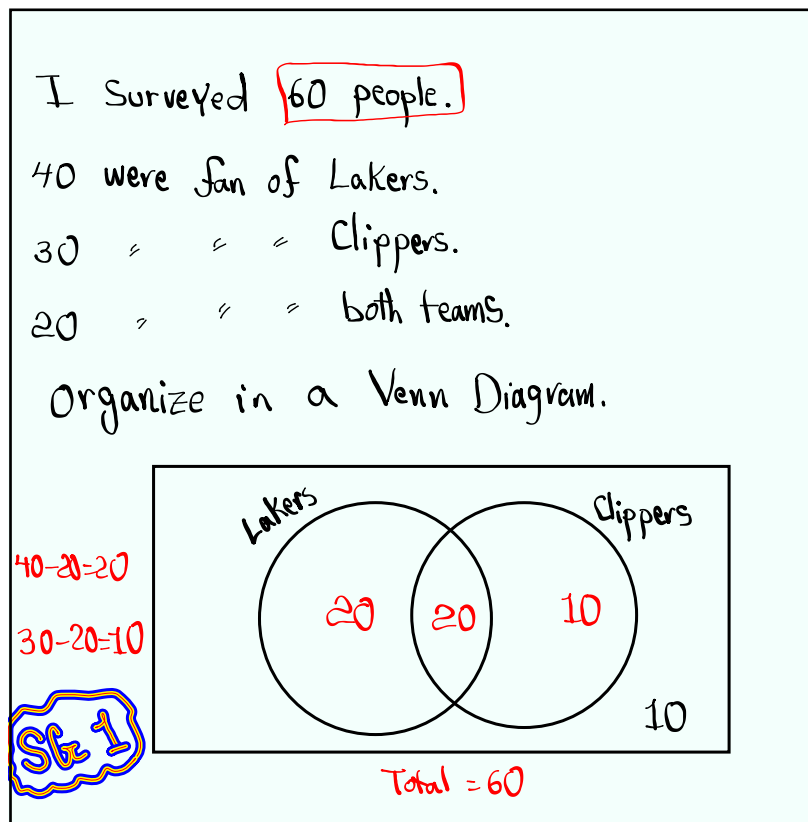
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What is Statistics?

It is study of information (Data).

will collect data, organize them,
graph them, do certain computations
Learn from them to make predictions.

Two Branches

1) Descriptive

collect data, organize, graph,
calculations

2) Inferential

We make predictions with
some level of confidence

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Population \Rightarrow Entire field of interest

Sample \Rightarrow Randomly Selected from
Population

Population \leftrightarrow Parameter

Sample \leftrightarrow Statistic

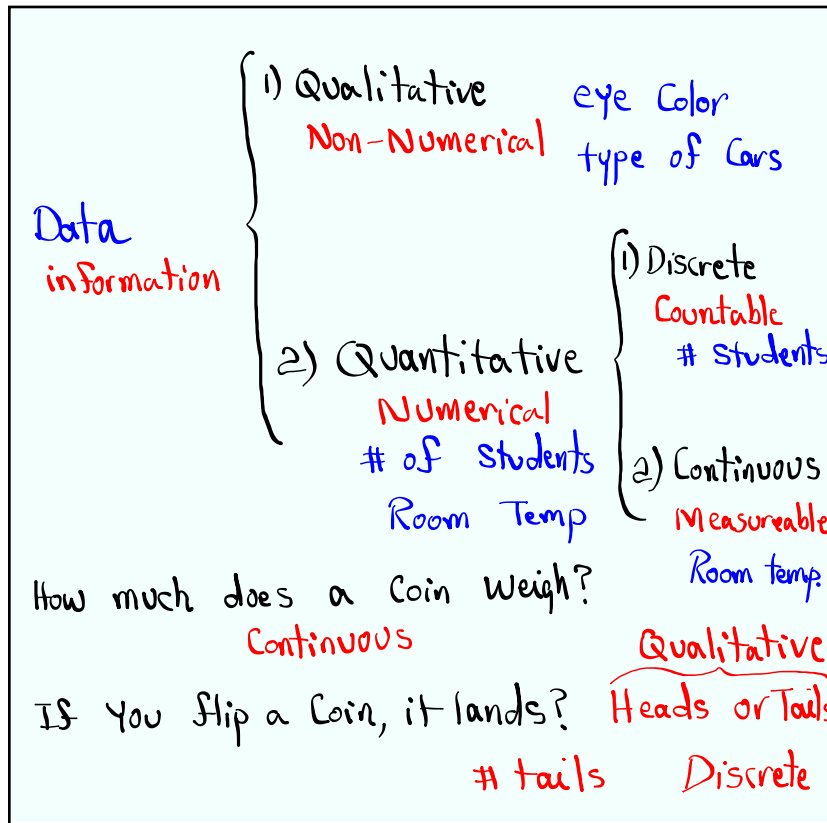
Average age of all nurses in LA is 45 Yrs.

Parameter

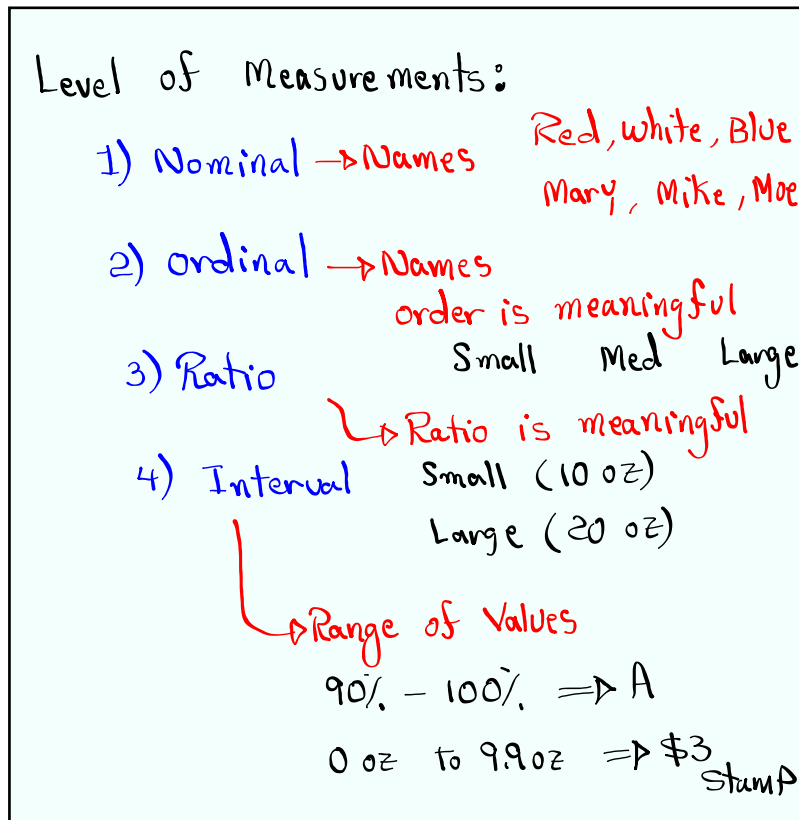
Median income of 20 basketball players
from NBA is \$5,000,000.

\Rightarrow Sample \Rightarrow Statistic

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Sampling Method (How to Collect Data)

1) Systematic

Every k th item selected for the survey.

2) Stratified

Divide into groups

Select few from each group.

Males	∴	Females
3		5

3) cluster

Divide into groups

Select few groups

Survey all members of selected groups.

4) Random or Convenience

Least Reliable Method

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I randomly selected 25 freshmen, 75 sophomore, 50 Jrs, 20 Srs, and 25 graduate students from CALstate LA for my project. Method: **Stratified**

I randomly selected 40 classes in Spring 2025 at college, and asked all students to do a survey. **Cluster**

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Google : Experiment
vs
Observation



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