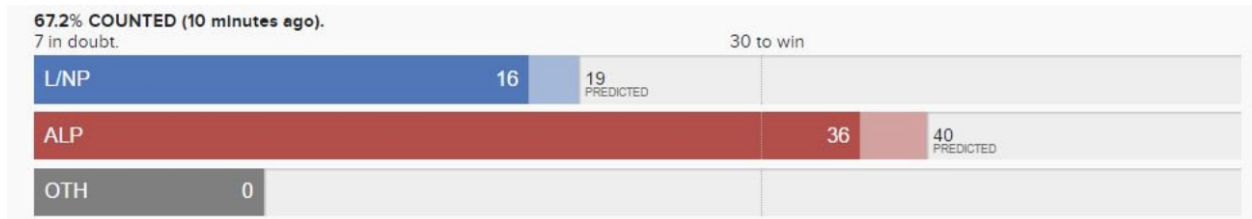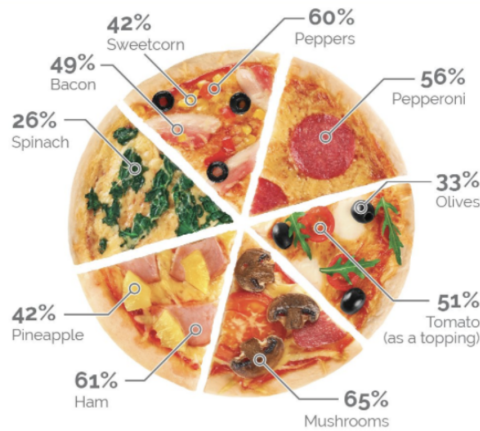**Name:** _____

MAT 121
Summer 2019
Homework 1

"That's what I do; I drink and I know things."
— *Tyrion Lannister, Game of Thrones*

Problem 1: Explain what (if anything) is problematic with the following graph used to summarize Australian election results:
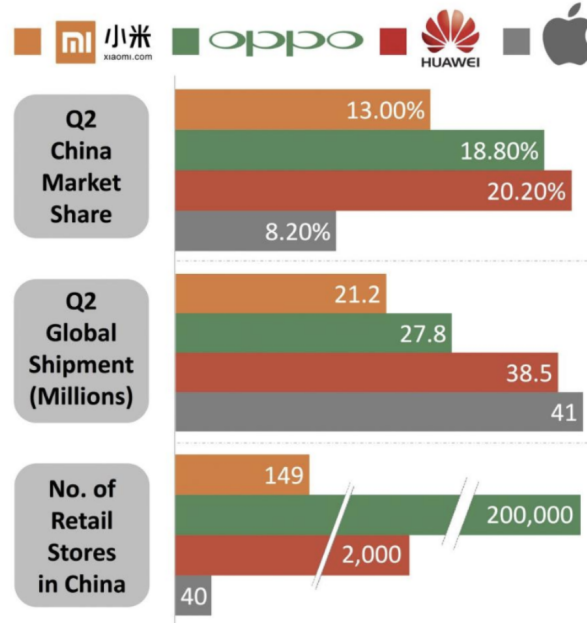

Problem 2: Explain what (if anything) is problematic with the following graph used to summarize pizza preferences in the UK.

Animalz. Lauren. Feb 7 2018. The Worst Graphs of 2017. https://getdolphins.com/blog/the-worst-graphs-of-2017/

Problem 3: Explain what (if anything) is problematic with the following graph used in a congressional hearing to summarize the connection of Hilary Clinton with Benghazi, Russia, and uranium.

Problem 4: Explain what (if anything) is problematic with the following graph used to compare smartphone makers.

How **Xiaomi** Stacks Up Against The World's Biggest Smartphone Makers

Legend: 小米 Xiaomi.com | OPPO | HUAWEI | Apple

	Xiaomi	OPPO	HUAWEI	Apple
Q2 China Market Share	13.00%	18.80%	20.20%	8.20%
Q2 Global Shipment (Millions)	21.2	27.8	38.5	41
No. of Retail Stores in China	149	200,000	2,000	40

Source: Counterpoint Research, IDC, Xiaomi, Apple, Huawei, Chinese Media Reports
Chart by Jinshan Hong/ FORBES

Forbes

Problem 5: Determine whether the following variables are quantitative or categorical:

(a) _____ : College major

(b) _____ : Car brand

(c) _____ : Phone number

(d) _____ : Grade number

(e) _____ : Speed (mph)

(f) _____ : Income

Problem 6: Determine whether the following data is discrete or continuous:

(a) _____ : Miles a car drives.

(b) _____ : Surface temperature of the Earth.

(c) _____ : Number of movies at the movie theatre.

(d) _____ : Number of particles in the universe.

Problem 7: Determine whether the following are a random sample, a simple random sample, or both.

(a) In a lecture audience, the student first alphabetically is chosen to come to the front.

(b) In a lecture hall, three random seat numbers are called and those seated come to the front.

(c) In a lecture hall, a random row is chosen to come to the front.

Problem 8: Determine whether the following measurements are nominal, ordinal, interval, or ratio:

(a) _____ : Wall Color

(b) _____ : Age

(c) _____ : Temperature (°F)

(d) _____ : Likert scale (Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree)

(e) _____ : Car Price

(f) _____ : Book Genre

(g) _____ : SAT Score (Redesigned: 400–1600)

(h) _____ : Exam Difficulty

Problem 9: Determine whether the following samples are random, systematic, convenience, stratified, or cluster:

(a) _____ : A news channel website polls people on a new government policy.

(b) _____ : From a list of large cities in a state, 7 are chosen and tax incomes are taken from every citizen in those cities.

(c) _____ : College students are broken up by gender and then a few from each gender are questioned.

(d) _____ : A phone survey company dials every 5th name in a directory.

(e) _____ : Names are chosen out of a hat.

Problem 10: Define a *matched pairs design* experimental design.

Problem 11: In a political poll, 26% (1,911 individuals) stated they had no plans on voting in the coming election. How many people were polled? If the poll were performed on 551 individuals, at least how many people would also have to not have plans to vote to achieve the same percentage?

Problem 12: Convert the following proportions to a percentage or percentages to a proportion:

(a) 44.7%

(b) 0.01

(c) 110%

(d) 0.05

(e) 2.23

Problem 13: Calculate the following to two decimal places:

(a) $\dfrac{127.6 - 111.3}{6.9} =$

(b) $\dfrac{56 - 71}{4} =$

(c) $\dfrac{\frac{556.3 - 561.2}{4.2}}{\sqrt{2}} =$

Problem 14: Solve for x in the following:

$$\frac{x - 56.3}{4.7} = 2.62$$