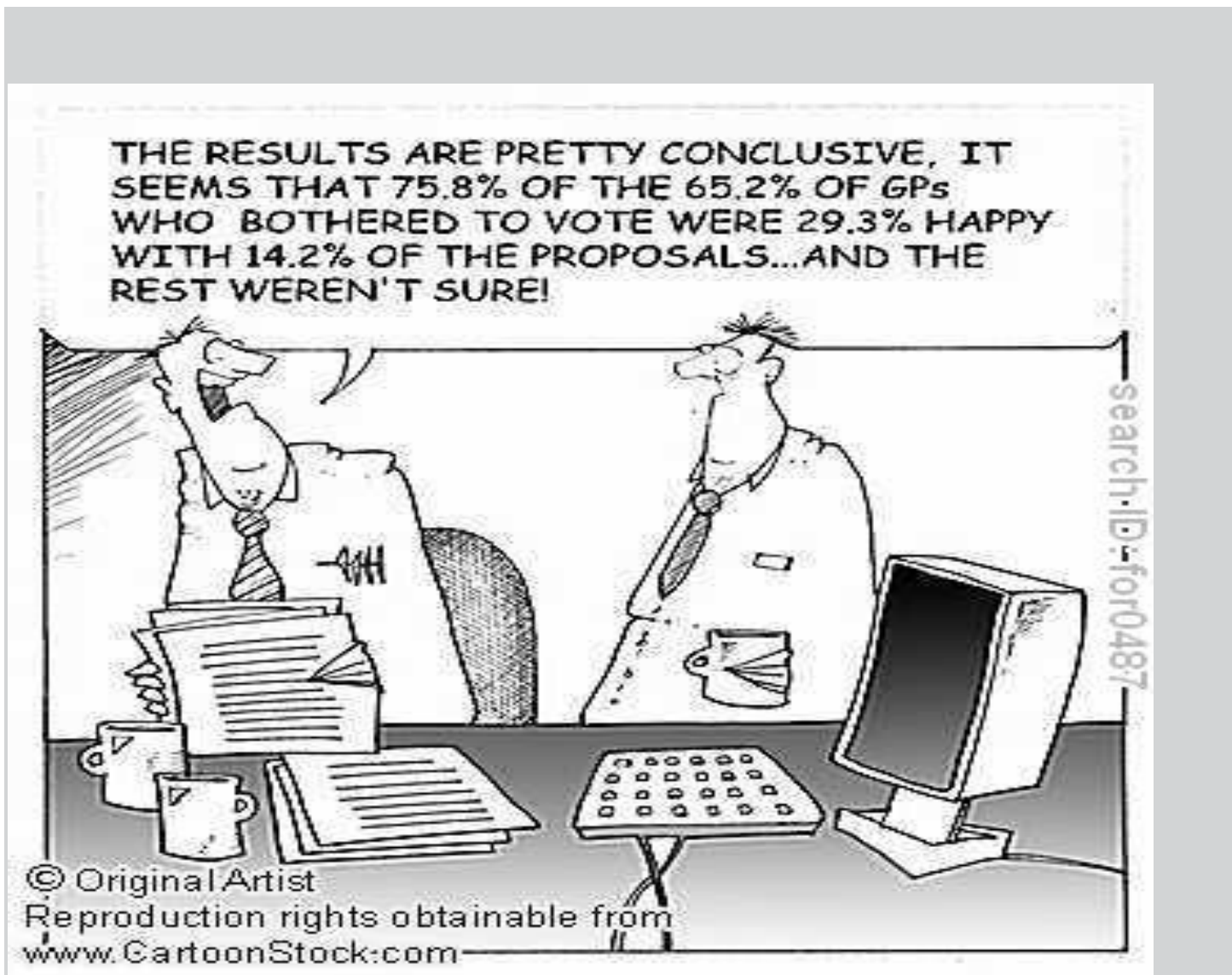


Name _____

AP Statistics Summer Packet



Welcome to Advanced Placement Statistics. The AP Statistics course is built around four main topics: exploring data, planning a study, probability as it relates to distributions of data, and inferential reasoning. Among leaders of industry, business, government, and education, almost everyone agrees that some knowledge of statistics is necessary to be an informed citizen or a productive worker. Numbers are regularly used and misused to justify opinions on public policy. Quantitative information is the basis for decision-making in virtually every job within business and industry.

Included in this packet are a set of questions corresponding with Chapters 1, 2, and 3. You are expected to *read and outline* those chapters as well as *answer these questions* based on your reading to show an assimilation of statistical ideas. Chapters 1, 2, and 3 and these questions are posted on the Math Department website.

You are expected to complete this packet before the start of school. I also expect that you will show the work needed to get the correct answers. I will answer questions concerning the packet during the first few days of school with an assessment shortly thereafter.

Good luck! I am looking forward to an exciting year working with students who are prepared for class and are willing to challenge themselves.

Math courses completed during high school: _____

**Advanced Placement Statistics
Summer Work 2010**

**Chapters 1-3
Questions**

These questions were taken directly from the text you will be receiving in the fall. Please complete all questions for credit. We will go over these chapters on the first few days of school, before you take the assessment.

Chapters 1 – 2

For each description, identify the W's, name the variables, specify for each variable whether its use indicates it should be treated as categorical or quantitative, and, for any quantitative variable, identify the units in which it measured (or note any they were not provided).

2) **Investments.** According to the article in *Fortune* (Dec. 28, 1992), 401(k) plans permit employees to shift part of their before-tax salaries into investments such as mutual funds. Employers typically match 50% of the employees' contribution up to about 6% of salary. One company, concerned with what it believed was a low employee participation rate in its 401(k) plan, sampled 30 other companies with similar plans and asked for their 401(k) participation rates.

5) **Weighing Bears.** Because of the difficulty of weighing bears in the woods, researchers caught and measured 54 bears, recording their weight, neck size, length, and sex. They hoped to find a way to estimate weight from other, more easily determined quantities.

8) **Firefighters.** A study was conducted to compare the abilities of men and women to perform the strenuous tasks required of a shipboard firefighter (*Human Factors* 24 [1982]). The study reports the pulling force (in newtons) that a firefighter was able to exert in pulling the starter cord of a P-250 water pump. The study also gives the weight and, of course, the gender of the firefighters.

15) **Cars.** A survey of autos parked in student and staff lots at a large university recorded the make, country of origin, type of vehicle (car, van, SUV, etc.), and age.

Chapter 3

5) **Magnet Schools.** An article in the Winter 2003 issue of Chance magazine reported the Huston independent School District's magnet school programs. Of the 1755 qualified applicants, 931 were accepted, 298 were wait-listed, and 526 were turned away for lack of space. Find the relative frequency distribution of the decisions made, and write a sentence describing it.

7) **Causes of Death.** The Centers for Disease Control lists causes of death in the United States during 1999.

Causes of Death	Percent
Heart Disease	30.3
Cancer	23.0
Circulatory Diseases and Stroke	8.4
Respiratory Diseases	7.9
Accidents	4.1

a) Is it reasonable to conclude that the heart or respiratory diseases were the cause of approximately 38% of U.S. deaths in 1999?

b) What percent of deaths were from causes not listed here?

c) Create an appropriate display for these data.

10) **Illegal guns.** A study by the U.S. Bureau of Alcohol, Tobacco, and Firearms (BATF) (*USA Today*, 22 June 2000) surveyed 1530 investigations by the U.S. BATF into illegal gun trafficking from July 1996 through December 1998. The study reports the portion of cases that were the result of each of five gun trafficking violations:

- 46% Straw purchase (legal gun buyer acting on behalf of an illegal buyer)
- 21% Unlicensed sellers
- 14% Gun show and flea markets
- 14% Stolen from federally licensed dealers
- 10% Stolen from residences

a) State the *W*'s for this study to the extent the story gives them.

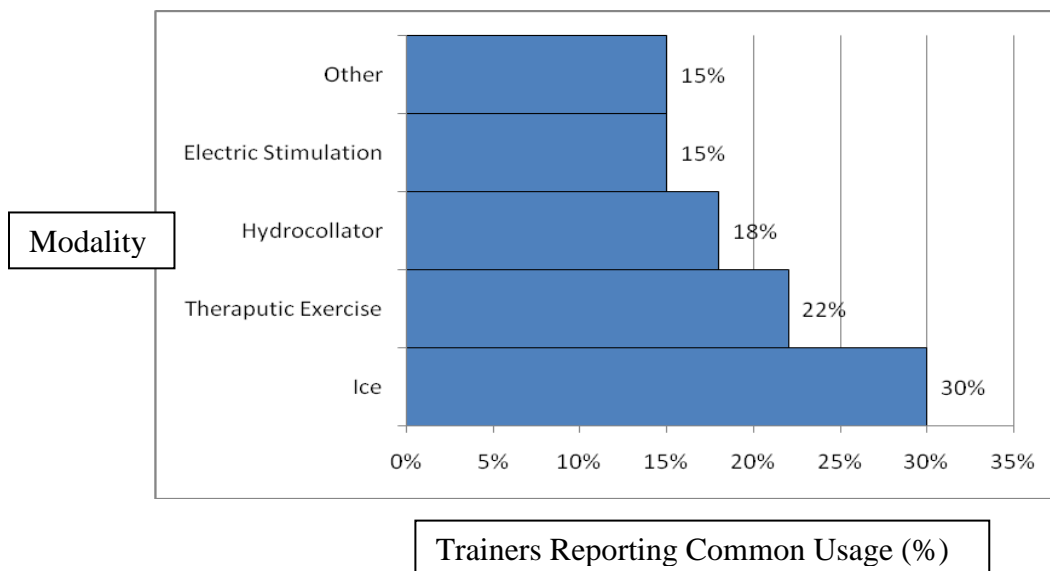
b) What do you notice about the percentages listed? What does that probably mean?

c) Make a bar chart to display the results, and label it correctly.

d) Write a brief report on what they say about illegal gun trafficking. Note any problems with the data.

e) The study also noted that although corrupt licensed dealers accounted for 133 of the 1530 investigations, they were linked to 40,365 of the 84,128 firearms involved in those investigations. How does this new information about the *Who* of the study affect your conclusions?

16) **Modalities.** A survey of athletic trainers (Nadler, Scott F., Prybicien, Michale, Malanga, Gerard A., Sicher, Dan. "Complications from Therapeutic Modalities: Results of a National Survey of Athletic Trainers." *Archives Physical Medical Rehabilitation* 84 [June 2003]) asked what modalities (treatment methods such as ice, whirlpool, ultrasound, or exercise) they commonly used to treat injuries. Respondents were each asked to list three modalities. The article included the following figure reporting the modalities used.



a) What problems do you see with this graph?

b) Consider the percentages of the named modalities. Do you see anything odd about them?

22) **Cars.** A survey of autos parked in student and staff lots at a large university classified the brands by country of origin, as seen in the table.

O R I G I N	Driver	
	Student	Staff
American	107	105
European	33	12
Asian	55	47

- What percent of all cars surveyed were foreign?
- What percent of the American cars were owned by students?
- What percent of students owned the American cars?
- What is the marginal distribution of the origin?
- What are the conditional distributions of the origin by driver classification?
- Do you think that the origin of the car is independent of the type of driver? Explain.

25) **Canadian Languages.** Statistics Canada provides, on its Web site, the following data on the Canadian population (in thousands). (Zeros indicate counts below 500.)

P R O V I N C E		English only	French only	Both	Neither	TOTAL
	Newfoundland	525	0	21	1	547
	Prince Edward Island	118	0	15	0	133
	Nova Scotia	813	1	84	1	900
	New Brunswick	418	73	238	0	730
	Quebec	359	3,952	2,661	74	7,045
	Ontario	9,116	47	1,235	245	10,643
	Manitoba	984	1	103	12	1,100
	Saskatchewan	921	0	51	5	977
	Alberta	2,455	2	179	34	2,669
	British Columbia	3,342	2	249	97	3,690
	Yukon Territory	27	0	3	0	31
	Northwest Territories	36	0	3	1	39
	Nanavut	20	0	1	4	25
TOTAL	19,134	4,078	4,843	474	28,529	

- a) What percent of Canadian citizens only speak English?

- b) What percent of Canadian citizens speak French?

- c) What percent of Quebec residents speak French?

- d) What percent of French-speaking Canadians live in Quebec?

- e) Do you think that the language knowledge and province of a residence are independent of Canadians? Explain.

26) **Tattoos.** A study by the university of Texas Southwestern Medical Center examined 626 people to see if there was an increased risk of contracting hepatitis C associated with having a tattoo. If the subject had a tattoo, researchers asked whether it had been done in a commercial tattoo parlor or elsewhere. Write a brief description of the association between tattooing and hepatitis C, including an appropriate graphical display.

	Tattoo done in a commercial parlor	Tattoo done elsewhere	No tattoo
Has hepatitis C	17	8	18
No hepatitis C	35	53	495

31) **Blood Pressure.** A company held a blood pressure screening clinic for its employees. The results are summarized in the table below by age group and blood pressure level.

	Age			
		Under 30	30 - 49	Over 50
Blood Pressure	Low	27	37	31
	Normal	48	91	93
	High	23	51	73

a) Find the marginal distribution of blood pressure level.

b) Find the conditional distribution of blood pressure level within each age group.

c) Compare these distributions with the segmented bar graph.

d) Write a brief description of the association between age and blood pressure among these employees.

e) Does this prove that people's blood pressure increases as they age? Explain.

