

Percent of Students by Attribute

Attribute	Section 12 1200	Section 07 1500
Use EXCEL	72	78
Took trig	50	44
Math anxiety of 8, 9, 10	39	63
Think math majors smarter	31	13
Prefer open book exams	28	22
Played poker for money	53	34
Have a car loan	16	19
Own stocks	19	34

It is interesting to note that in Section 07 only 13% of the students thought math majors were smarter than English majors; however, 63% had a math anxiety of eight or higher. Compare this with Section 12.

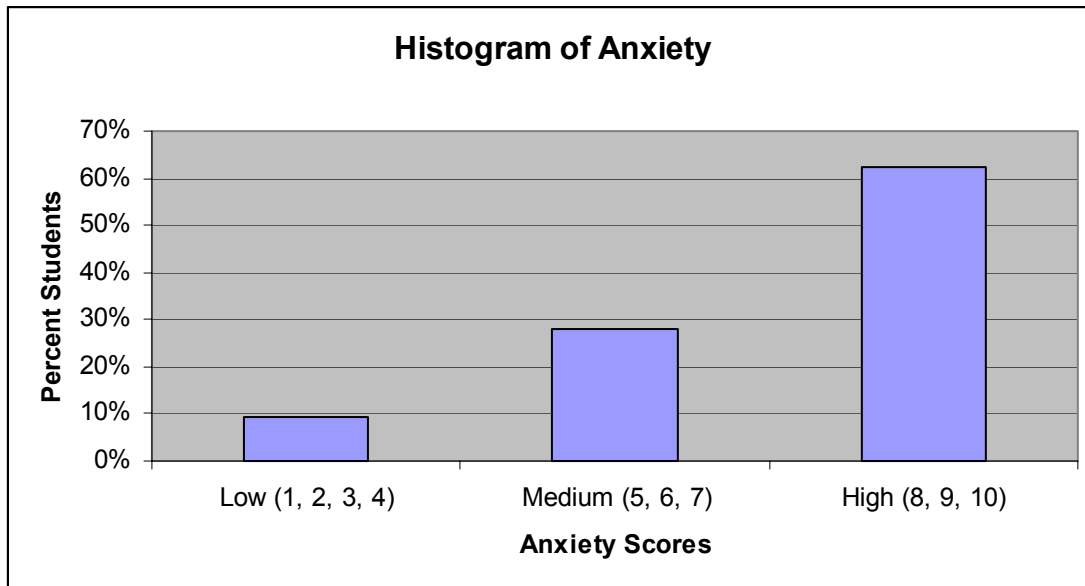
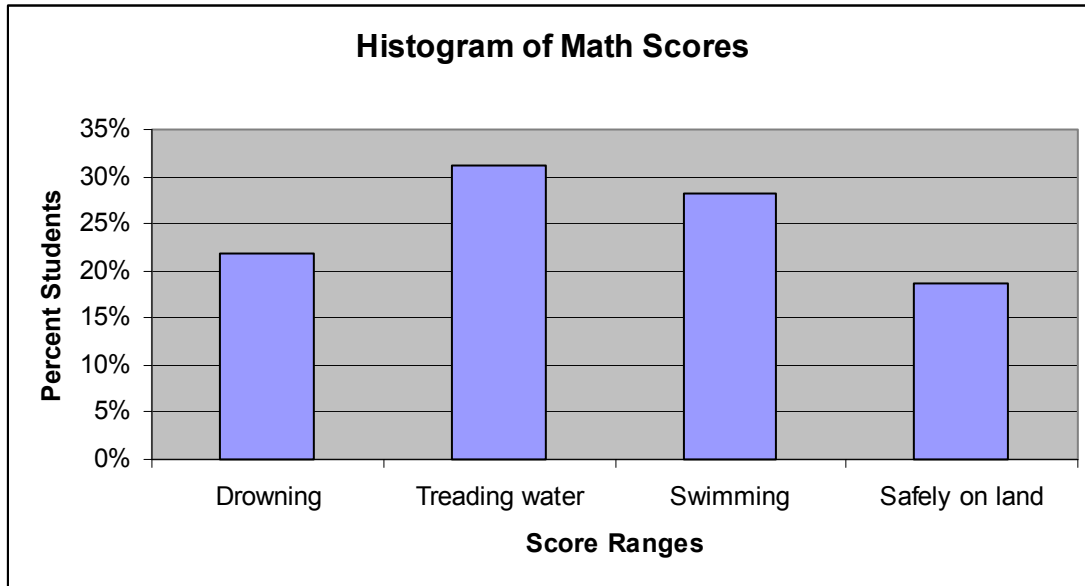
Frequency Distributions**Frequency Distribution of Score for Section 007**

Category	Range	Count	Percent
Drowning	0-3	7	22
Treading Water	4-7	10	31
Swimming	8-9	9	28
Safely on Land	10-15	6	19
Total		32	100

Frequency Distribution of Anxiety for Section 007

Category	Range	Count	Percent
Low	0-4	3	9
Medium	5-7	9	28
High	8-10	20	63
Total		32	100

Histogram of Math Score for Section 007



Note that a histogram is just a bar chart where bars represent frequencies or percents, where the percents can be interpreted as probabilities.

In both classes the 90th percentile of score was 11.

Percent of Males and Females**Section 07**

	Count	Percent
Males	12	38
Females	20	62
Total	32	100

Section 12

	Count	Percent
Males	14	37
Females	24	63
Total	38	100

These percents are probability distributions because the values are between zero and one, and they total to 1.0. Notice how similarly the distributions are for each section.

Averages**Comparison of Anxiety and Score by Section**

	Section 012		Section 007	
	Anxiety	Score	Anxiety	Score
Min	0	1	1	1
Max	10	14	10	15
Mean	6.2	6.8	7.4	6.9
Median	6	6	8	7
Mode	10	4	8	8
Mean Deviation	2.6	2.8	1.8	3.1
Variance	9.3	14.4	4.9	14.4
Standard Dev	3.1	3.4	2.2	3.8

The math scores were very consistent between sections. Section 007 had a higher level of math anxiety with less variance.

The math book question provided no useful information because nearly everyone answered it the same: no book.

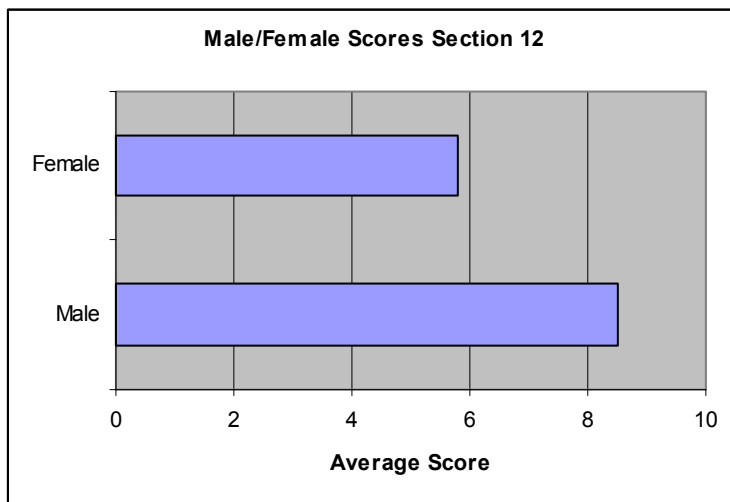
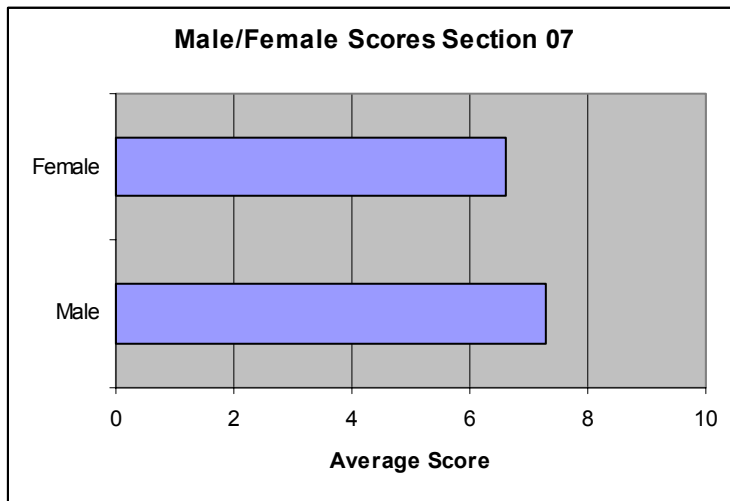
Conditional Averages

	Section 012	Section 07
Female / Male	5.8 / 8.5	6.6 / 7.3
Poker Yes / No	7.3 / 5.6	8.1 / 6.1
Stocks Yes / No	7.7 / 6.6	9.0 / 5.8

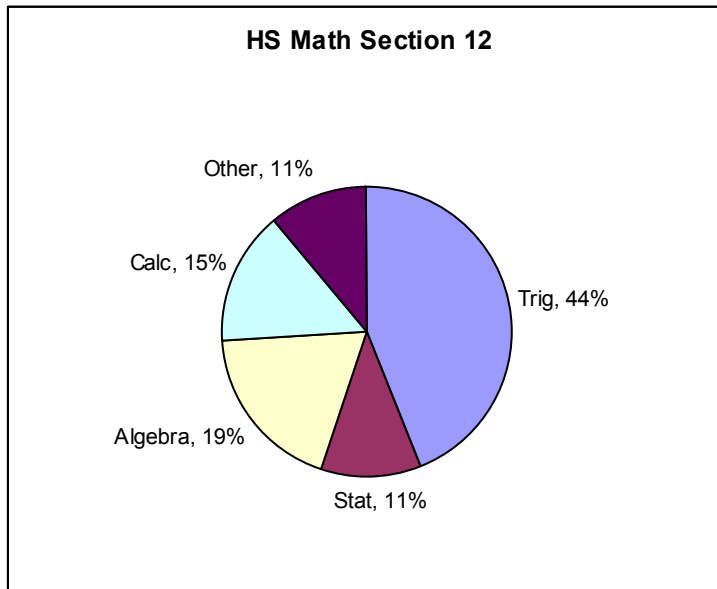
Different presentation of the same data given above

	Female	Male	Poker Y	Poker N	Stocks Y	Stocks N
Sect 007	6.6	7.3	8.1	6.1	9.0	5.8
Sect 012	5.8	8.5	7.3	5.6	7.7	6.6

Men did better than women; poker players did better than non poker players; and stock owners did better than non owners. Maybe the Math 106 classes should be divided by poker players and non poker players.



Pie Chart of Majors



Two-Way Tables – also called two-way cross tabulations or joint frequency distributions

Sets

Sex = {M, F}, number of elements = 2

Poker = {Y, N}, number of elements = 2

Joint Set = {MY, MN, FY, FN}, number of elements = $2 \times 2 = 4$

Section 007 1500

	Male	Female	Totals	Percents
Poker Yes	7	4	11	34%
Poker No	5	16	21	66%
Totals	12	20	32	100%
Percents	38%	62%	100%	

Percent of men who play poker = $7/12 = 58\%$

Percent of women who play poker $4/20 = 20\%$

Section 012 1200

	Male	Female	Totals	Percents
Poker Yes	7	9	16	42%
Poker No	7	15	22	58%
Totals	14	24	38	100%
Percents	37%	63%	100%	

Percent of men who play poker = $7/14 = 50\%$

Percent of women who play poker $9/24 = 38\%$

Percent who Play Poker

	Men	Women
Section 007	58	20
Section 012	50	38

Probability Distribution

Probability distribution of sex for section 012: $P(\text{man}) = .37$, $P(\text{woman}) = .63$

Probability distribution of poker for section 012: $P(Y) = .42$, $P(N) = .58$

Joint probability distribution: $P(MY)=7/38$, $P(MN)=7/38$, $P(FY)=9/38$, $P(FN)=15/38$

Probability distribution = relative frequency distribution

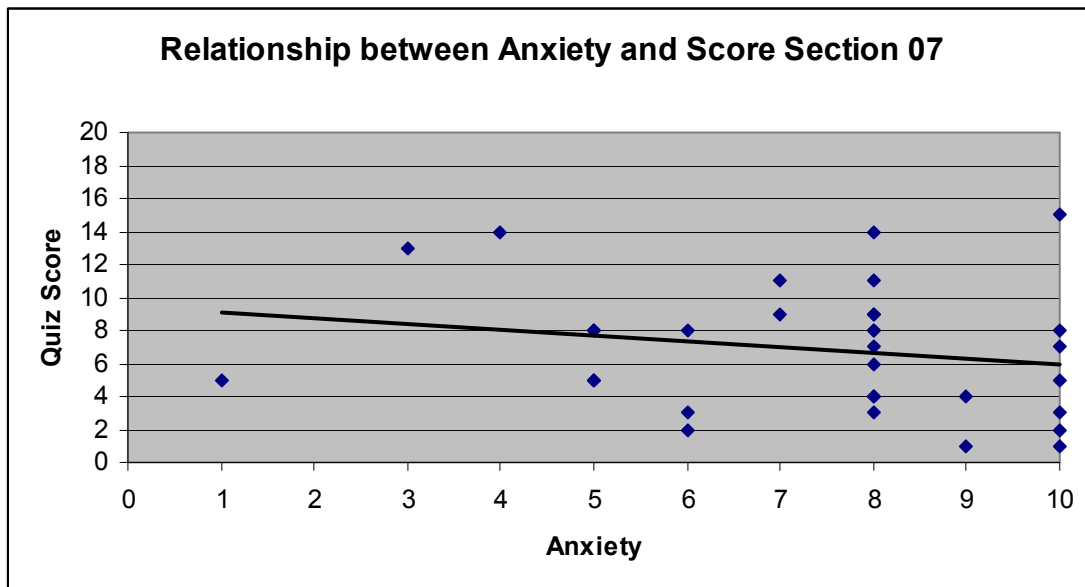
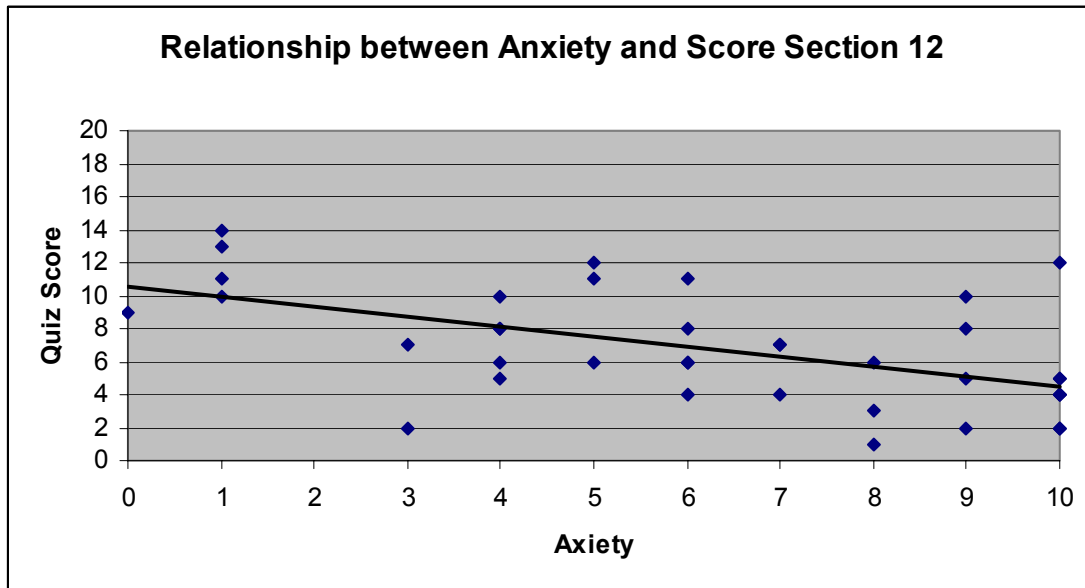
$$0 \leq p_i \leq 1$$

$$\sum_{i=1}^n p_i = 1$$

Sample versus Population

Each class represents one sample of all Math 106 sections. We could also sample within a section. A sample is a **subset** of a population. Can we consider each class to be a representative sample of all Math 106 students? Based upon the data, the two classes are very homogeneous and most likely represent good samples of all Math 106 students.

Scatter Plots



The correlation for Section 07 was only $r = -.21$, while the correlation for Section 12 was stronger with $r = -.54$