

SCORE_____

1. In a recent semester at a local university, 480 students enrolled in both General Chemistry and Calculus I. Of these students, 66 received an A in general chemistry, 58 received an A in calculus, and 30 received an A in both general chemistry and calculus. Find the probability that a randomly chosen student received an A in general chemistry or calculus or both.

[6 points]

2. The the mean of the data in the following stem-and-leaf plot. The leaf represents the ones digit.

1		2288
2		018
3		58
4		6

[6 points]

3. A consumer advocacy group tested the "on-air" lifetimes of a random sample of 152 cell phone batteries. The mean lifetime was 2.9 hours with a standard deviation of 0.4 hours. The lifetimes are approximately bell-shaped. Estimate the number of batteries with lifetimes between 2.5 hours and 3.3 hours.

[5 points]

4. Four students were asked to rate their statistics course on a scale of one to ten. The results were

3 3 8 10

Find the mean, median, mode, range, variance and standard deviation.

$$\left(\text{Recall, the variance } s^2 = \frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n-1} \text{ or } s^2 = \frac{n \sum_{i=1}^n (x_i)^2 - \left(\sum_{i=1}^n x_i \right)^2}{n-1} \right)$$

[12 points]

5. An experiment results in one of five outcomes with the following probabilities:
 $P(E_1) = .13$, $P(E_2) = .25$, $P(E_3) = .22$, $P(E_4) = .26$, and $P(E_5) = .14$

A: $\{E_1, E_5\}$

B: $\{E_1, E_3, E_4\}$.

Find each of the following probabilities

(a) $P(A)$

[3 points]

(b) $P(B)$

[3 points]

(c) $P(A \text{ and } B)$

[3 points]

(d) $P(A|B)$

[3 points]

(e) $P(A^c)$

[3 points]

(f) $P(B^c)$

[3 points]

(g) Are A and B independent? Are A and B mutually exclusive?

[3 points]

6. For the data set below, find the interquartile range (IQR) and the upper outlier boundary:

160, 176, 193, 144, 163, 146, 152, 158, 154, 184, 129

[8 points]

7. The following table contains data from a study of two airlines which fly to Small Town, USA

	Number of On-time flights	Number of late flights	Total
Podunk Airlines	33	6	39
Upstate Airlines	43	5	48
Total	76	11	87

- (a) If one of the 87 flights is randomly selected, find the probability that the flight selected is an Upstate Airlines flight which was on time.

[4 points]

- (b) If one of the 87 flights is randomly selected and we know the flight is late, find the probability the flight is a Podunk Airlines flight.

[4 points]

- (c) If one of the 87 flights is randomly selected and we know the flight is an Upstate Airlines flight, find the probability the flight was on time.

[4 points]

8. Gina and Stewart are surf-fishing on the Atlantic coast, where both bluefish and pompano are common catches. The mean length of a bluefish is 288 millimeters with a standard deviation of 51mm. For pompano, the mean is 129 mm with a standard deviation of 40 mm. Who caught the longer fish, relative to fish of the same species?

- (a) Stewart caught a bluefish that was 321 mm long. What was the z-score for this length?

[4 points]

- (b) Gina caught a pompano that was 209 mm long. What was the z-score for this length?

[4 points]

- (c) Who caught the longer fish, relative to fish of the same species?

[4 points]

9. The depth of snow at a ski resort are collected every year for 12 years on the 1st of February. All data is given in centimeters and arranged in numerical order...

40, 45, 55, 60, 65, 65, 70, 75, 75, 80, 85, 90

Construct a box plot.

[8 points]

10. Suppose $P(A) = 0.5$ and $P(B) = 0.4$ and $P(A \text{ and } B) = 0.1$. Find $P(A \text{ or } B)$.

[5 points]

11. One of the primary feeds for beef cattle is corn. The following table presets the average price in dollars for a bushel of corn and a pound of ribeye steak for 10 consecutive months.

<i>CornPrice(\$/bu)</i>	<i>RibeyePrice(\$/lb)</i>
5.82	13.01
5.70	12.24
5.80	13.01
5.84	12.94
6.56	13.89
6.21	13.04
6.39	13.01
6.61	13.76
6.06	12.53
5.84	12.95

The correlation coefficient between the corn price and the ribeye price is 0.773. Which of the following is the best interpretation of the correlation coefficient?

- (a) The price of ribeye tends to go down and the price of corn goes up.
- (b) The changes in corn price and ribeye price tend to go up and down together.
- (c) Increasing corn prices cause ribeye prices to increase.
- (d) There is no correlation between the price of corn and the price of ribeye.

[5 points]