Note: This is NOT a practice exam. It is a collection of problems to help you review some of the material for the exam and to practice some kinds of problems. This collection is not necessarily exhaustive; you should expect some problems on the exam to look different from these problems.

Section 7.1

1. The following test scores are for two classes that took the same test. The highest possible score on the test was 60.

Class 1 (45 scores): 19, 19, 24, 24, 27, 34, 34, 35, 35, 38, 39, 39, 40, 40, 40, 41, 41, 42, 42, 43, 44, 44, 45, 45, 47, 48, 48, 49, 49, 50, 50, 50, 51, 51, 51, 53, 53, 53, 56, 56, 56, 56, 57, 57, 59.

Class 2 (42 scores): 22, 27, 28, 29, 31, 32, 32, 33, 33, 33, 34, 34, 35, 36, 36, 37, 38, 39, 40, 40, 40, 41, 41, 43, 43, 44, 44, 45, 45, 48, 48, 50, 50, 50, 50, 51, 51, 53, 56, 56, 56.

a. Form a back-to-back ordered stem-and-leaf plot.

b. Which class appears to have better performance? Support your answer.

2. The following stem-and-leaf plot gives the weight in pounds of the students in the Algebra 1 class at East Junior High:

Weights of students in East Junior High Algebra 1 Class

7	2 4
8	1 1 2 5 7 8
9	2 4 7 8
10	3
11	
12	2 5

10 | 3 represents 103 lb

a. How many students are represented?

b. Write the weights of the students?

c. What is the median weight of the students?

3. Draw a histogram based on the stem-and-leaf plot in the previous problem.

4. HKM Company employs 40 people of the following ages:

34	58	21	63	48	52	24	52	37	23
23	34	45	46	23	26	21	18	41	27
23	45	32	63	20	19	21	23	54	62
41	32	26	41	25	18	23	34	29	26

a. Draw an ordered stem-and-leaf plot for the data.

b. Are more employees in their 40s or in their 50s?

c. How many employees are less than 30 years old?

d. What percent of the people are 50 years or older?

e. Use the stem-and-leaf plot to find the median age. Explain how you <u>used the plot</u> to find the median.

ANSWERS Section 7.1

1.

a.

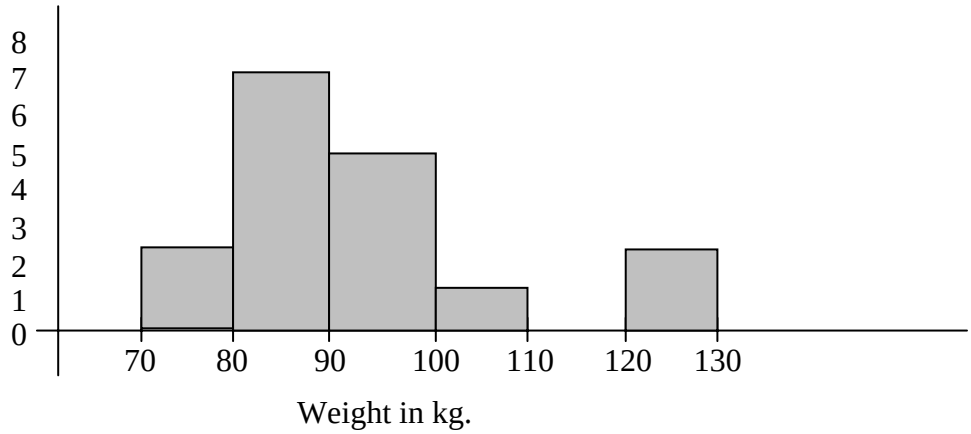
Scores on Test

Class One		Class Two
9 9	1	
7 4 4	2	2 7 8 9
9 9 8 5 5 4 4	3	1 2 2 3 3 3 4 4 5 6 6 7 8 9
9 9 8 8 7 5 5 4 4 3 2 1 1 0 0 0	4	0 0 0 1 1 3 3 4 4 5 5 8 8
9 7 7 6 6 6 6 3 3 3 1 1 1 0 0 0	5	0 0 0 0 1 1 3 6 6 6

b. Class 1 has 75% of the scores at 40 or above, but Class 2 has only 57% at 40 or above. Thus, I would say Class 1 did better.

2. a. 15
b. 72, 74, 81, 81, 82, 85, 87, 88, 92, 94, 97, 98, 103, 122, 125
c. 88 lb

3. Weights of students in East Jr. High Algebra 1 Class



4. a.

Ages of HKM Employees

1	8 8 9
2	0 1 1 1 3 3 3 3 3 3 4 5 6 6 6 7 9
3	2 2 4 4 4 7
4	1 1 1 5 5 6 8
5	2 2 4 8
6	2 3 3

b. 40s c. 20 d. 17.5%

e. Since the plot is ordered, you can count "leaves" to find the median, which is between 29 and 32, or 30.5 years old.

Section 7.2

1. Find the mean and median for the following list of test scores:
67, 93, 74, 83, 62, 56, 90, 70, 88, 95, 74, 74, 65, 84, 70, 71, 89, 91, 95

2. Ten newborn babies at a hospital had these weights in pounds:
7.0, 9.5, 6.8, 7.1, 10.1, 8.6, 5.9, 6.2, 7.7, 8.1.
a. What is the mean weight of these ten babies?
b. What must be the weight of an eleventh baby for the mean weight to become 8.5 pounds?

3. The average of six daily high temperatures is 58˚ Fahrenheit. If two of the temperatures were 48˚ and 32˚, what was the average of the other four temperatures?

4. Lindsay is the CEO of a company that reports the mean income for their 10 employees is $85,000 including her salary. If she gets $210,000 a year, what is the mean income of the other 9 employees?

5. Mr. Smith's class of 42 students had a mean score of 74% on an exam. Mrs. Jones's class of 33 students had a mean score of 84% on the same exam. What was the overall mean score of both classes?

6. Find the mean, median, upper quartile, and lower quartile of the following test scores:
43, 43, 53, 54, 55, 58, 58, 60, 62, 62, 63, 68, 70, 78, 83, 85, 86, 86, 89, 92

7. Construct a box-and-whisker plot for the following data. Indicate any outliers with asterisks. Identify numbers that you used to construct the plot.

55, 68, 72, 74, 75, 76, 76, 77, 80, 82, 82, 83, 83, 83, 85, 86, 86, 87, 87, 87, 88, 88, 90, 90, 90, 94, 94, 96, 99, 102

8. The following test scores are for two classes that took the same test. The highest possible score on the test was 60. Construct a box-and-whisker plot for the data. Indicate any outliers with asterisks. Which class appears to have performed better on the test? Defend your choice.

Class 1 (32 scores): 19, 24, 27, 34, 35, 35, 38, 39, 40, 40, 41, 41, 42, 43, 44, 44, 45, 47, 48, 49, 50, 50, 51, 51, 53, 53, 56, 56, 56, 57, 57, 59.

Class 2 (23 scores): 22, 28, 31, 32, 33, 34, 34, 35, 36, 37, 39, 40, 40, 41, 43, 44, 45, 45, 50, 50, 50, 51, 56.

9. The following list gives the mass, in kilograms, of each child in Ms. Rathert's class. Construct a box-and-whisker plot for the data. Indicate any outliers with asterisks. Identify numbers that you used to construct the plot.
31, 39, 39, 39, 40, 40, 41, 42, 42, 42, 42, 43, 43, 44, 45, 46, 47, 48, 49, 49, 49, 60

10. The following table shows fast food items that are high in salt.
a. Draw a box-and-whisker plot for the data. Label the points used to make the plot.
b. Is the median closer to the lower quartile or the upper quartile?
c. Is the mean closer to the lower quartile or the upper quartile?
d. Are there any outliers in the data? Explain.

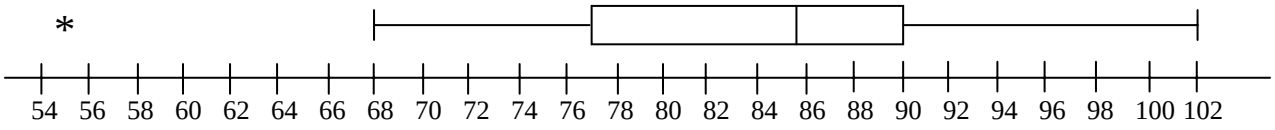
Food item	Milligrams of salt
Fish sandwich	1018
Bacon sandwich	1180
Pancakes	1264

Ham biscuit	1415
Ham & Cheese sandwich	1550
Pasta Salad	1570
Chicken Salad	1582
Roast beef sandwich	1953
Fish & chips	2016

ANSWERS Section 7.2

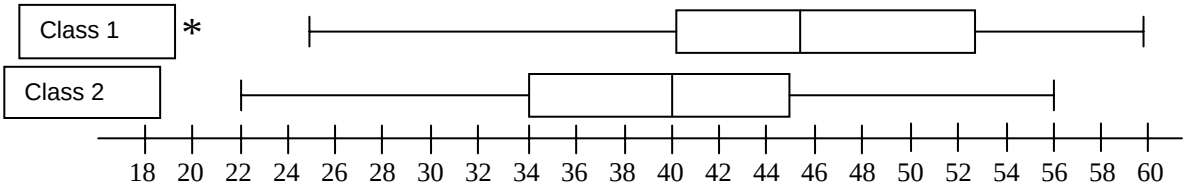
1. Mean = 78.47, median = 74.
2. Ten newborn babies at a hospital had these weights in pounds:
   7.0, 9.5, 6.8, 7.1, 10.1, 8.6, 5.9, 6.2, 7.7, 8.1.
   a. Mean = 7.7 lbs
   b. The eleventh baby would need to weigh a whopping 16.5 pounds!
3. 67˚
4. $71,111
5. 78.4%
6. Mean = 67.4, Median = 62.5, Lower Quartile = 56.5, Upper Quartile = 84.

7. The median is 85.5, the lower quartile is 77, and the upper quartile is 90. The inner quartile range (IQR) is 90-77 = 13. 1.5 × IQR = 19.5. So any score below 57.5 or above 109.5 is an outlier.



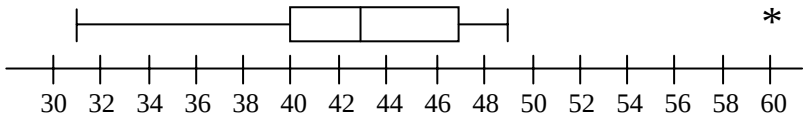
8. Class 1 median = 44.5, lower quartile = 39.5, upper quartile = 52, 1.5 × IQR = 18.75, outliers below 20.75 and above 70.75.

   Class 2 median = 40, lower quartile = 34, upper quartile = 45, 1.5 × IQR = 16.5, so outliers below 17.5 and above 61.5

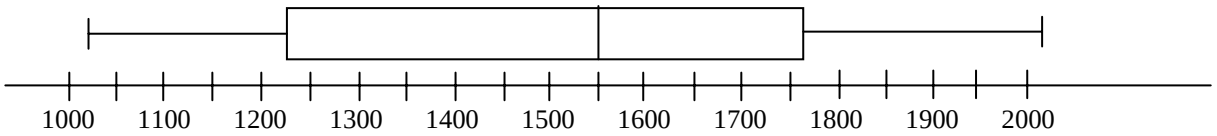


Class 1 appears to have done better. Note that the upper quartile of class 2 is barely above the median of class 1. This means fully 50% of class 1 did as well or better than the top 25% of class 2.

9. Median = 42.5, lower quartile = 40, upper quartile = 47, 1.5 × IQR = 10.5, outliers below 29.5 and above 57.5



10. a. Median = 1550, lower quartile = 1222, upper quartile = 1767.5, 1.5 × IQR = 818.25, so outliers would lie below 403.75 or above 2585.75.



b. The median is closer to the upper quartile.
c. The mean is 1505, so it is closer to the upper quartile.
d. No outliers, see work above.

Section 7.3

1. For a certain group of people, the mean height is 182 cm, with a standard deviation of 11 cm.
   a. Anna's height is 170 cm. What is the z-score for her height?
   b. Juanita's height has a z-score of 1.4. What is her height?

2. Andy scored 20 on a math quiz. The mean score on the quiz was 16, and the standard deviation was 2.2. Andy scored 52 on another quiz, where the mean score was 48 and the standard deviation 3.1. Use z-scores to compare his performance on the two quizzes.

3. The mean IQ score for 1500 students is 100, with a standard deviation of 15. Assuming the scores have a normal distribution, determine the following:
   a. How many have an IQ between 85 and 115?
   b. How many have an IQ between 70 and 130?
   c. How many have an IQ over 145?

4. Calculate the standard deviation for the following set of data. Be sure to show all of your work!
   17, 19, 19, 28, 30, 35

5. Sugar Plops boxes say they contain 16 oz of cereal. To make sure they do, the manufacturer fills the boxes to a mean weight of 16.1 oz, with a standard deviation of 0.05 oz. If the weights are distributed normally, what percent of the boxes actually contain 16 oz or more? What percent contain less than 16 oz?

ANSWERS Section 7.3
1. a. –1.09 b. 197.4 cm

2. *z*-score on first quiz: 1.82
   z-score on second quiz: 1.29
   Andy did better on first quiz
3. a. 1020 b. 1425 c. 2

4. 6.70

5. 97.5% have 16 oz or more, so 2.5% have less than 16 oz.