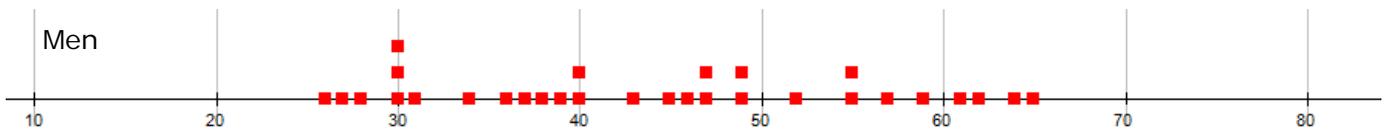


Routine Box and Whisker Practice #1

Q1 The results of a drug test on 30 men and 30 women are below. High values are bad.

Discuss the differences in results by sex. Did the drugs work better on men or women?

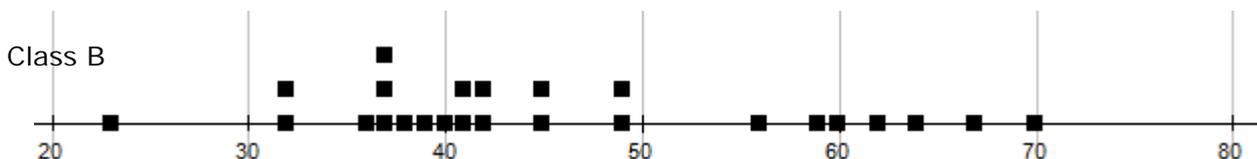
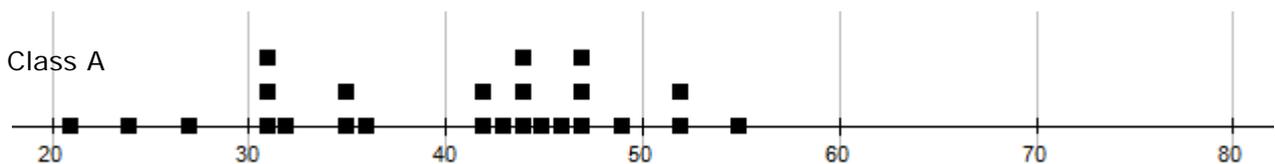
	Men	Women
Lowest	26.0	36.2
Q1	34.3	43.4
Median	43.7	46.0
Q3	54.7	50.1
Highest	64.1	58.1
Mean	44.0	46.4



Q2 Two classes sit a Geometry test. There are 25 people in each class.

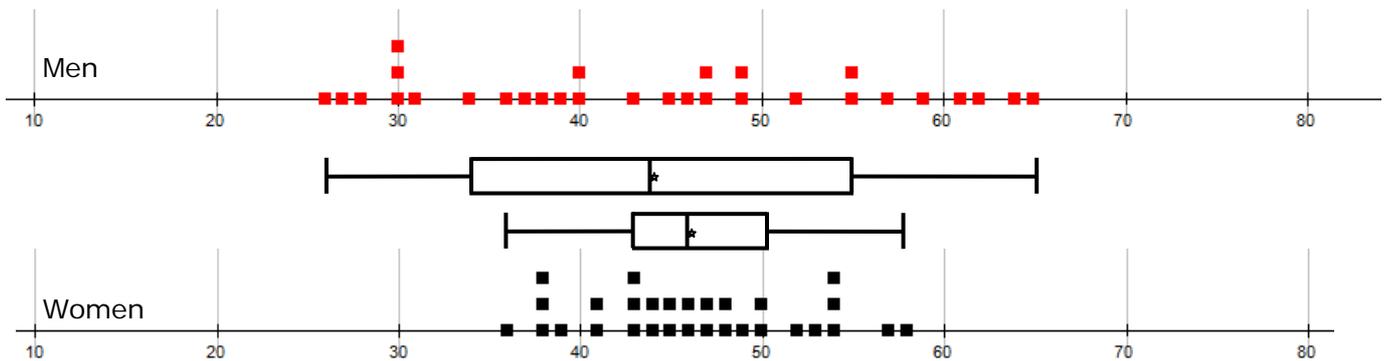
Which class did better? Discuss the differences between the classes.

	Class A	Class B
Lowest	21	23
Q1	31.5	37
Median	43	42
Q3	47	57.5
Highest	55	70
Mean	40.0	45.6



Suggested Answers: Routine Box and Whisker Practice #1

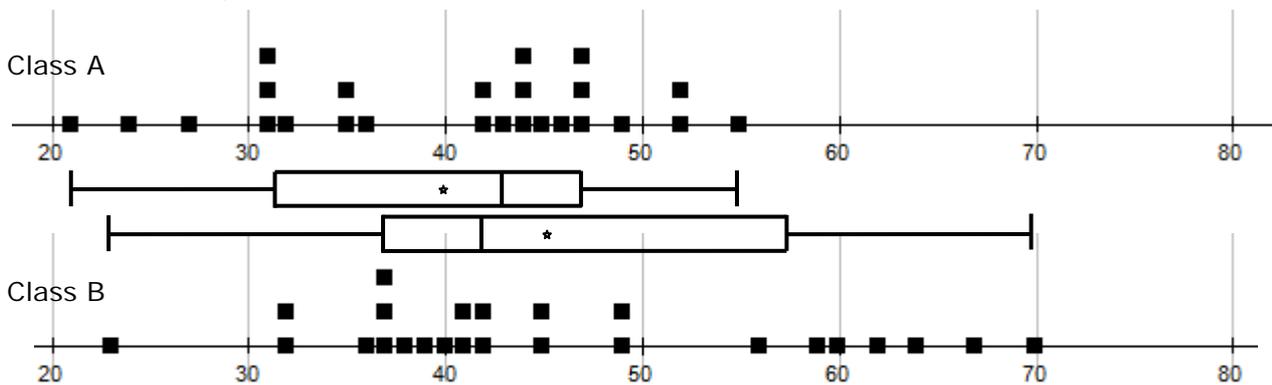
Q1 Drug test (Note: high values are bad.)



The differences are:

- 1) That the typical male did better (lower) than the typical female. This is shown by the fact that the male median is lower 2.3 lower. The means are very similar to the medians, which suggests that those values are good guides to the "typical" person.
The median results are inside the opposite IQR band in both cases. This suggests that their difference may just be from random sampling. In particular the true median of the male result may vary a lot with such a wide IQR (we can see that it would only take two values currently in the bottom half to be high to make it higher than the female median).
- 2) The drug's effect was much more consistent for females. This can be seen by the fact that the range and the interquartile range are smaller (a third in the case of the IQRs).
- 3) The spread of values is relatively even and symmetric in both cases, although there may be a slightly small clumping at the low values for men.

Q2 Geometry test



I cannot say with any confidence which class did better, though on balance I would say that it was Class B. This is because:

- 1) The median for Class A is higher than for Class B, which means the middle result in Class A was slightly higher. However the mean for Class B was higher, which suggests Class B did better. The extremes and 1st and 3rd quartile points are also much higher for Class B, which is why that class is probably better, on the whole, even if the median is lower.
Merit: the median results are well inside the opposite inter-quartile band in both cases. This means the difference in medians could easily be due to sample variation.
- 2) Both classes are similarly spread, with class B having a slightly higher range and IQR..
- 3) Their appears to be little symmetry and a lot of clumping, especially around 45 for Class A and 40 for Class B. Class A has a bit of a "tail" to low values, whereas Class B has to high values. This asymmetry is the reason the means and medians disagree so much.