### 4.3 Boxplots and IQR

1. Find the 5\# summary \& IQR for each set of data.
a. $\{9,11,15,17,23,24,33,33,38,38,45,46,51\}$

b. $\{20,25,30,32,35,40,40,43,44,46,47,51,57,60\}$

c. $(47,43,35,34,32,21,17,16,11,9,5,5\}$ $\qquad$
2. Use the dotplot to create a boxplot. Plot the Boxplot on the same axis above the dotplot.

$n=12$ $\operatorname{minX}=5$ $Q_{1}=10$
$M e d=19$ Q3 $=34.5$ maxX=47

Push these buttons for 5\# Summary. Don't forget to scroll



The top 25\% read between 4 (Q3) and 9 (max) books.
3.

a. Circle the points that represent the $5 \#$ summary values. If 2 points are needed to calculate a value, draw a circle around both points.
b. List the 5-number summary for each data set.

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\(\operatorname{Min}=0\)
Min \(=64\)
Q1 \(=1 \quad\) Q1 \(=75\)
Med \(=1.5 \quad\) Med \(=80\)
Q3 \(=3\)
Max \(=7\)
\(I Q R=3-1=2\)
\(I Q R=86-75=11\)
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a. $\{23,25,26,|28,28,28,|28,30,31| 33,41,43\}$,
b. $\{23,23,24,25,26,27,29,30,31,33,41,43\}$
c. $\{27,53\}$

Only $a$. and d. have a 5\# summary of $\{23,27,28,32,43\}$
d. $\{23,27,28, \underline{28}, 29,32,43\}$
5. Describe the boxplot above as skewed left, symmetric, or skewed right and tell why. Fidn IQR.

The box plot above is skewed right because the values are spread out more on the right.
The middle $50 \%$ of data lays between 27 and 32. The IQR is 5 .
6. Match each boxplot with the data set:




Histogram \#1 Matches Boxplot $\qquad$
Histogram \#2 Matches Boxplot $\qquad$ Histogram \#3 Matches Boxplot $\mathbf{A}$
a. is spread on on the right, or skewed right (3)
b. is symmetric (1)
c. is spread out on the left, or skewed left (2)


5 \# summary: $\operatorname{Min}=5, Q 1=7, M e d=8.5, Q 3=9.5, M a x=12 \quad I Q R=2.5$
b. Games in the World Series: $\{5,7,5,7,6,6,7,7,6,5,7,7.6,5,7\}$

5 \# summary: $\operatorname{Min}=5, Q 1=5, M e d=6, Q 3=7, M a x=7 \quad I Q R=2$

c. Number of Words in Book Title $\{2,6,4,5,4,3,1,3,3,6,2,1,1,4,1\}$

5 \# summary: $M i n=1, Q 1=1, M e d=3, Q 3=4, M a x=6 \quad I Q R=3$

8. The following boxplots are called "Beanplots" because they look weird and freak people out. Describe the relationships between the numbers in the five number summaries for each plot:


For this shape of Boxplot, the Min must equal the Q1, and the max must equal the Q3. Also, the median is equal to Q1 or Q3, but we can't tell which one.
c.


## SMP \#2

For this shape, Q1 the Median and Q3 must be all equal.

For this shape, The Median, Q3 and the Maximum values are all equal to each other. Minimum Value must be different.
9. Multiply: $(2 x-1)^{2}$
$(2 x-1)(2 x-1)$
$4 x^{2}-2 x-2 x+1$
$=4 x^{2}-4 x+1$
11. Solve the following system:
$y=-5$
$-2 x-(-5)=3$
$-2 x=-2 \quad x=1$
10. Solve the following equation for $w$ :

$z \cdot \frac{1}{z} w=\left(\frac{r}{x}-t\right) \cdot 2$

$$
w=2\left(\frac{r}{x}-t\right)
$$

(1, -5)

