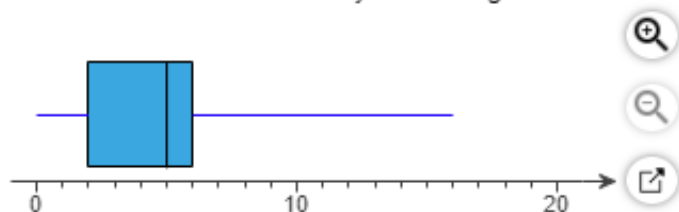(a) Identify the shape of the distribution, and (b) determine the five-number summary. Assume that each number in the five-number summary is an integer.

a. Choose the correct answer below for the shape of the distribution.

○ A. The distribution is roughly symmetric.
◉ B. The distribution is skewed right.
○ C. The distribution is skewed left.
○ D. The shape of the distribution cannot be determined from the boxplot.

b. The five-number summary is $\boxed{0}$, $\boxed{2}$, $\boxed{5}$, $\boxed{6}$, $\boxed{16}$.

Violent crimes include rape, robbery, assault, and homicide. The following is a summary of the violent-crime rate (violent crimes per 100,000 population) for all states of a country in a certain year. Complete parts (a) through (d).

$Q_1 = 273.8$, $Q_2 = 387.4$, $Q_3 = 528.3$

(a) Provide an interpretation of these results. Choose the correct answer below.

25% of the states have a violent-crime rate that is 273.8 crimes per 100,000 population or less. 50% of the states have a violent-crime rate that is 387.4 crimes per 100,000 population or less. 75% of the states have a violent-crime rate that is 528.3 crimes per 100,000 population or less.

(b) Determine and interpret the interquartile range.

The interquartile range is $\boxed{254.5}$ crimes per 100,000 population.
(Type an integer or a decimal.)

$\boxed{IQR = Q_3 - Q_1}$

Interpret the interquartile range. Choose the correct answer below.

The middle 50% of all observations have a range of 254.5 crimes per 100,000 population.

The lower fence is $\boxed{-107.95}$ crimes per 100,000 population.
The upper fence is $\boxed{910.05}$ crimes per 100,000 population.
(Round to two decimal places as needed.)

$\boxed{\begin{array}{l} \text{Lower fence} - Q_1 - 1.5(IQR) \\ \text{Upper fence} - Q_3 + 1.5(IQR) \end{array}}$

The violent-crime rate in a certain state of the country in that year was 1,496. Would this be an outlier?

◉ A. Yes, because it is greater than the upper fence.

(d) Do you believe that the distribution of violent-crime rates is skewed or symmetric?

The distribution of violent-crime rates is skewed right.

The following data represent the monthly phone use, in minutes, of a customer enrolled in a fraud prevention program for the past 20 months. The phone company decides to use the upper fence as the cutoff point for the number of minutes at which the customer should be contacted. What is the cutoff point?

344	441	528	497
303	469	447	456
447	419	506	392
466	495	434	475
530	396	348	314

The cutoff point is 622 minutes.
(Round to the nearest minute.)

Use stat crunch to find Q_3 and IQR

Upper fence= $Q_3+(1.5)$IQR

In a boxplot, if the median is to the left of the center of the box and the right whisker is substantially longer than the left whisker, the distribution is skewed right .

Use the side-by-side boxplots shown to complete parts (a) through (e).
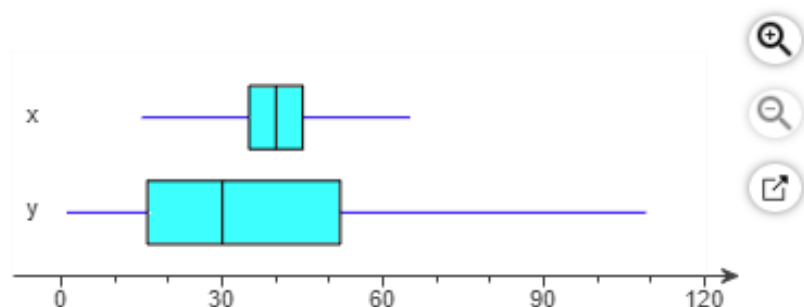
(a) What is the median of variable x?

The median of variable x is 40 . (Round to the nearest integer as needed.)

(b) What is the third quartile of variable y?

The third quartile of variable y is 52 . (Round to the nearest integer as needed.)

(c) Which variable has more dispersion? Why?

◉ A. Variable y—the interquartile range of variable y is larger than that of variable x.

(d) Describe the shape of the variable x. Support your position. Choose the correct answer below.

◉ A. Symmetric—the median is the center of the box and the left and right whiskers are about the same length

(e) Describe the shape of the variable y. Support your position. Choose the correct answer below.

◉ A. Skewed right—the median is left of center in the box and the left whisker is shorter than the right whisker.

The data to the right represent the number of chocolate chips per cookie in a random sample of a name brand and a store brand. Complete parts (a) to (c) below.

Full data set ▢

Name Brand			Store Brand		
23	28	35	22	17	27
24	29	22	23	29	22
25	30	23	30	33	24
28	26	32	27	20	26
22			16		

(a) Draw side-by-side boxplots for each brand of cookie. Label the boxplots "N" for the name brand and "S" for the store brand. Choose the correct answer below.

○ A.   ◉ B.   ○ C.
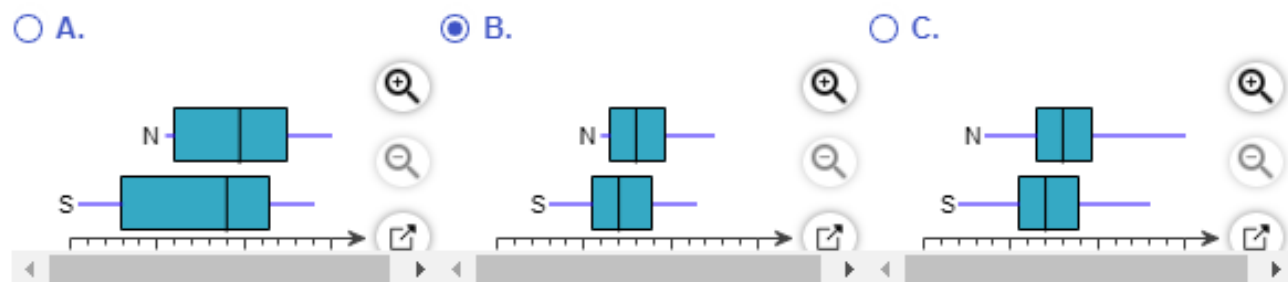
(b) Does there appear to be a difference in the number of chips per cookie?

◉ A. Yes. The name brand appears to have more chips per cookie.
○ B. No. There appears to be no difference in the number of chips per cookie.
○ C. Yes. The store brand appears to have more chips per cookie.
○ D. There is insufficient information to draw a conclusion.

(c) Does one brand have a more consistent number of chips per cookie?

○ A. No. Both brands have roughly the same number of chips per cookie.
○ B. Yes. The store brand has a more consistent number of chips per cookie.
◉ C. Yes. The name brand has a more consistent number of chips per cookie.
○ D. There is insufficient information to draw a conclusion.

Suppose babies born after a gestation period of 32 to 35 weeks have a mean weight of 2500 grams and a standard deviation of 800 grams while babies born after a gestation period of 40 weeks have a mean weight of 2700 grams and a standard deviation of 340 grams. If a 33-week gestation period baby weighs 2200 grams and a 40-week gestation period baby weighs 2400 grams, find the corresponding z-scores. Which baby weighs less relative to the gestation period?

Find the corresponding z-scores. Which baby weighs relatively less? Select the correct choice below and fill in the answer boxes to complete your choice.
(Round to two decimal places as needed.)

$$x = \frac{2200-2500}{800} = -.38 \qquad x = \frac{2400-2700}{340} = -.88$$

◉ D. The baby born in week 40 weighs relatively less since its z-score, $-.88$, is smaller than the z-score of $-.38$ for the baby born in week 33.

A manufacturer of bolts has a quality-control policy that requires it to destroy any bolts that are more than 4 standard deviations from the mean. The quality-control engineer knows that the bolts coming off the assembly line have mean length of 15 cm with a standard deviation of 0.05 cm. For what lengths will a bolt be destroyed?

Select the correct choice below and fill in the answer box(es) to complete your choice.
(Round to one decimal place as needed.)

⦿ A. A bolt will be destroyed if the length is less than 14.8 cm or greater than 15.2 cm.

15- 4(.05)=14.8   15+4(.05)= 15.2

The following data represent the weight (in grams) of a random sample of 13 medicine tablets. Find the five-number summary, and construct a boxplot for the data. Comment on the shape of the distribution.

| 0.609 0.610 0.608 0.605 |
| 0.599 0.607 0.610 0.605 |
| 0.610 0.612 0.600 0.612 |
| 0.610 |

The five-number summary is .599 , .605 , .609 , .61 , .612 .

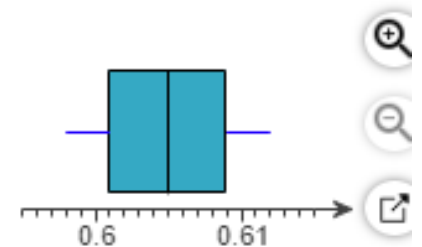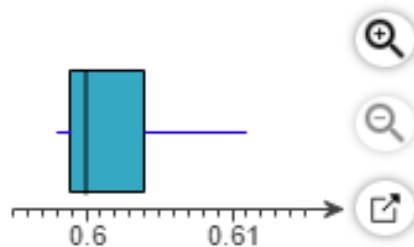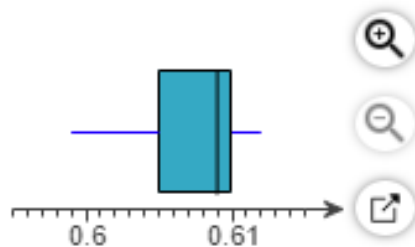Lowest-Q_1, Median, Q_3, Highest

Choose the correct boxplot of the data below.

⦿ A.   ○ B.   ○ C.

Choose the correct description of the shape of the distribution.

○ A. The distribution is skewed to the right.
○ B. The distribution is roughly symmetrical.
⦿ C. The distribution is skewed to the left.
○ D. The shape of the distribution cannot be determined from the boxplot.

One year Frank had the lowest ERA (earned-run average, mean number of runs yielded per nine innings pitched) of any male pitcher at his school, with an ERA of 3.48. Also, Julie had the lowest ERA of any female pitcher at the school with an ERA of 3.34. For the males, the mean ERA was 3.715 and the standard deviation was 0.851. For the females, the mean ERA was 4.253 and the standard deviation was 0.518. Find their respective z-scores. Which player had the better year relative to their peers, Frank or Julie? (Note: In general, the lower the ERA, the better the pitcher.)

Frank had an ERA with a z-score of $-.28$.

$$z = \frac{x - \mu}{\sigma}$$

Julie had an ERA with a z-score of -1.76.

(Round to two decimal places as needed.)

$$z = \frac{3.48 - 3.715}{.851} = -0.28$$

Which player had a better year in comparison with their peers?

$$z = \frac{3.34 - 4.253}{.518} = -1.76$$

- ○ A. Frank had a better year because of a higher z-score.
- ○ B. Frank had a better year because of a lower z-score.
- ○ C. Julie had a better year because of a higher z-score.
- ⦿ D. Julie had a better year because of a lower z-score.