

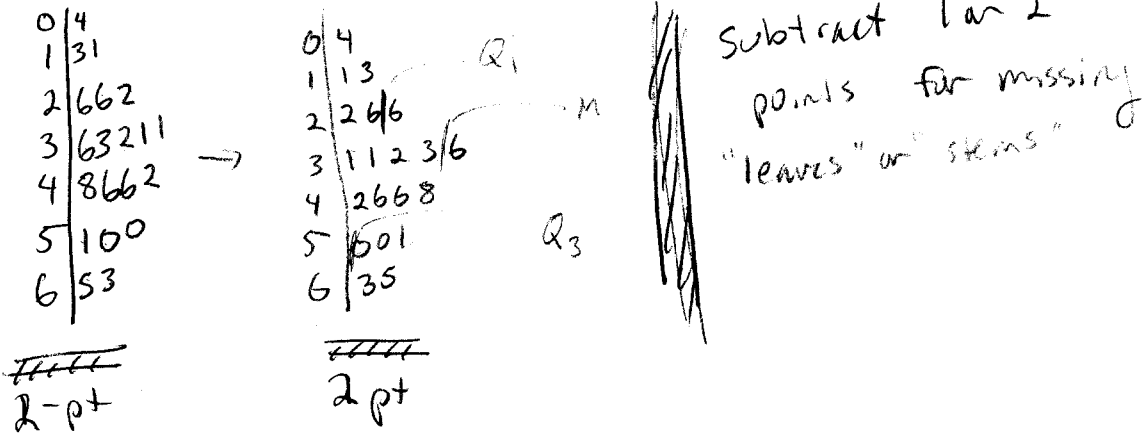
Name KEY

For credit show or explain all answers.

1. Recommendations of sugar consumption are no more than 6 teaspoons of sugar daily for women and 9 for men. Researchers recorded the amount of sugar 20 boys aged 14-18 consumed in 24-hours to the nearest teaspoon. The following data were obtained:

4	51	65	11
13	26	63	50
26	33	22	31
36	46	32	42
48	50	46	31

- (a). (4 pts) Construct a stemplot of this data.



- (b). (5 pts) Give the five-number summary for this data. Show your work.

$\frac{\min}{4}$      $\frac{Q_1}{26}$      $\frac{M}{34.5}$      $\frac{Q_3}{49}$      $\frac{\max}{65}$     one point each

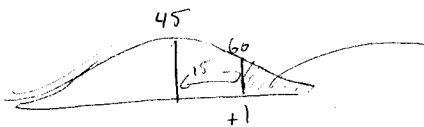
or

$$M \text{ is @ } \frac{n+1}{2} = \frac{21}{2} = 10.5 \rightarrow \frac{33+36}{2} = \frac{69}{2} = 34.5$$

$$Q_3 = \frac{48+50}{2} = 49$$

2. Guidelines suggest that children and adolescents get a minimum of 60 minutes of physical activity daily. Findings suggest the actual daily amount of physical activity of boys aged 14-18 receive is normally distributed with a mean of 45 minutes and a standard deviation of 15 minutes.

(a). (3 pts) What percent of boys get 60 minutes or more of physical activity each day? (You may use the 68-95-99.7 rule to answer this question.)



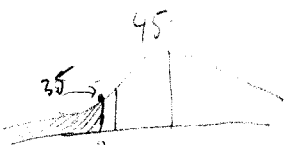
$$\frac{1-.68}{2} = \frac{.32}{2} = .16$$

16%

~~1 point~~  
2 pts for the set up

~~1 point~~  
1 for the correct answer

(b). (3 pts) What percent of boys get ~~less than 25~~ at least 35 minutes of exercise daily?



$$z = \frac{x - \mu}{\sigma} = \frac{35 - 45}{15} = \frac{-10}{15} = -0.67$$

~~1 point~~  
1-point

Table A

.2514

~~1 point~~  
1-point

$$Rt = 1 - .2514 = .7486 = 74.86\%$$

(c). (3 pts) What percent of boys get between 25 and 35 minutes of exercise daily?



$$z = \frac{25 - 45}{15} = -1.33$$

~~1 point~~  
1-point

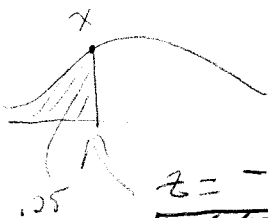
Table A

.0918

~~1 point~~  
1-point

$$.2514 - .0918 = .1598 = 15.98\%$$

(d). (3 pts) ~~How many~~ <sup>what is the highest # of minutes</sup> minutes of physical activity do the lowest 25% of boys receive? ~~that~~



$$z = -0.67$$

1-point

$$x = z(\sigma) + \mu$$

$$x = (-0.67)(15) + 45$$

1-point

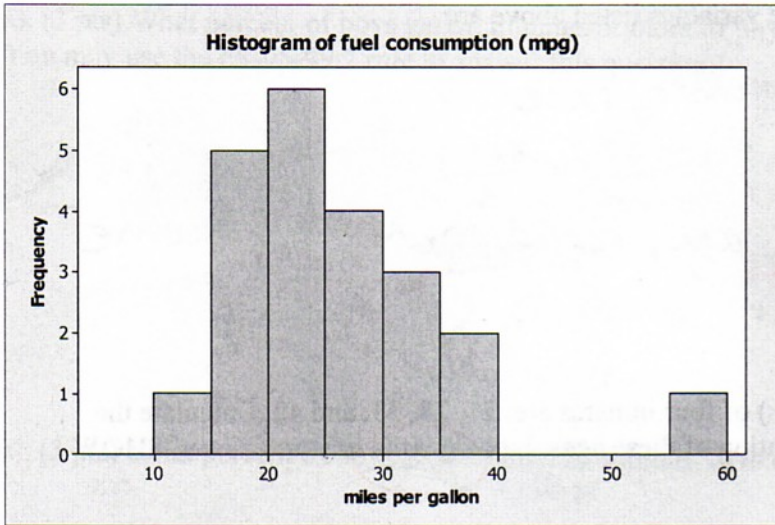
$$x = 34.95$$

$$x \approx 35 \text{ minutes}$$

1-point



4. Highway fuel consumption was measured in a random sample of 22 vehicles. A histogram of their fuel consumption in miles per gallon appears below.



- (a) (4 pts) Describe the shape, center, and spread of this histogram. Are there any outliers? *Note: No calculations are necessary.*

Shape: right skewed  
 Center: 20-25  
 Spread: 10 - to - 60 mpg  
 Outliers: one possible at 55-60 mpg

1 pt. each

- (b) (4 pts) If the bar on the far right-hand side of the distribution is removed, will the value of the mean of the distribution increase, decrease, or stay the same? Explain your answer. *Note: No calculations are necessary.*

Means are not resistant to extreme values. An extreme to the right will pull the mean the right. If the extreme is removed the mean will shift to the left, or decrease!

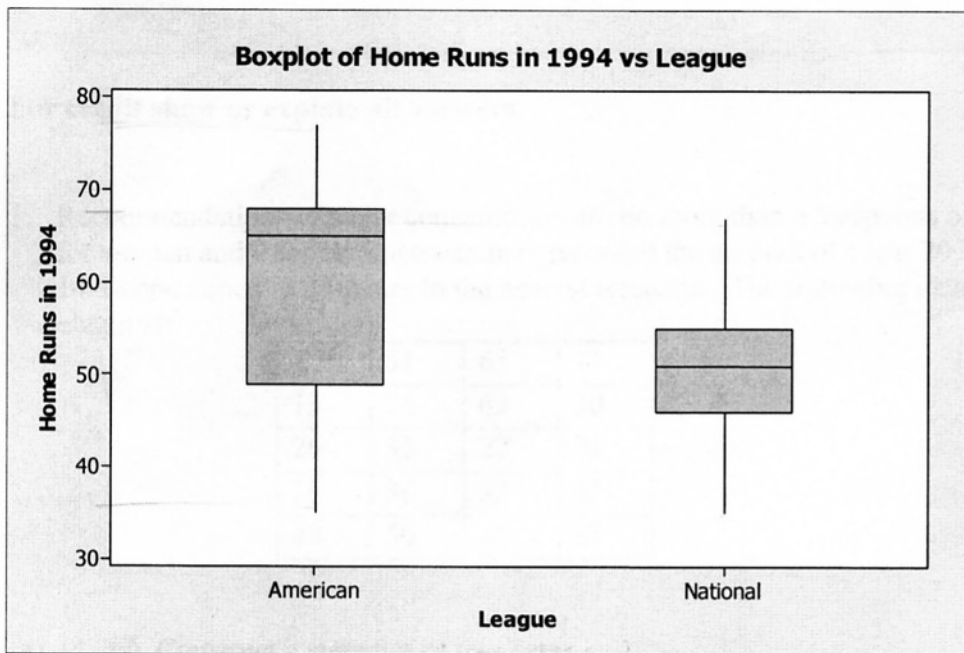
- (c) (4 pts) What percent of vehicles have fuel consumption less than 20 mpg?

$$\frac{\text{freq of bar 1 + bar 2}}{22} = \frac{1+5}{22} = \frac{6}{22} = 27.3\%$$

~~3 pts.~~ 1 pt.

2 pts for correct answer  
 2 pts for explanation

5. Below are side-by-side boxplots comparing home runs in 1994 in the American and National baseball leagues. Use these boxplots to answer the following questions.



- (a). (4 pts) Approximately what percent of the American league teams have home runs greater than 65?

50% ~~||~~ — all-or-nothing

- (b). (4 pts) Which league has the larger standard deviation, American or National? Explain your answer.

greater variability

The amount of variation in a population is indicated by the spread of the distribution. The American league clearly has a greater spread or range of values in its distribution and thus it also has greater variability.

2 pts. answer  
2 pts. explanation