# Measures of Central Tendency & Variation

**Find the mean, median, and mode of each set of data.**

1.) {5,7,4,7,6,7}

mean: $\bar{x} = 6$
median: 6.5
mode: 7

2.) {2,4,4,6,6,6,7,8}

mean: $\bar{x} = 5.375$
median = 6
Mode = 6

3.) {10,14,18,22,26}

mean: $\bar{x} = 18$
median: 18
mode: none

4.) {4,16,25,9,36,49}

mean: $\bar{x} = 23.1\overline{6}$
median: 20.5
mode: none

5.) {1,7,7,2,3,14,127,8}

mean: $\bar{x} = 21.125$
median: 7
mode: 7

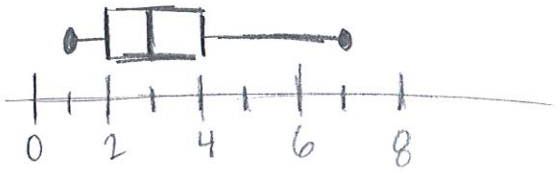
6.) {5,10,15,20,25}

mean: $\bar{x} = 15$
median: 15
mode: none

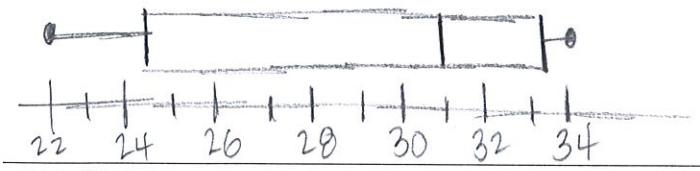
**Make a box-and-whisker plot of the data. Find the interquartile range.**

7.) {3,5,2,2,8,9,1,11} IQR = 8.5 − 2 = 6.5

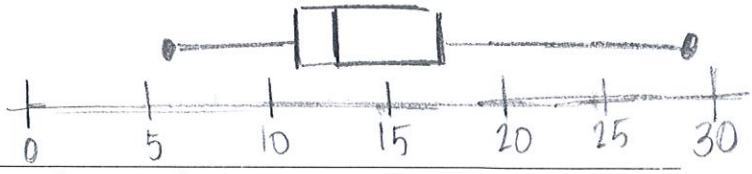

8.) {2,4,1,4,2,2,7,4} IQR = 4 − 2 = 2




9.) {33,34,31,27,22} IQR = 33.5 − 24.5 = 9

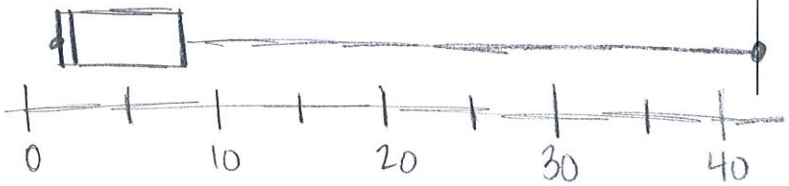



10.) {12,15,12,6,18,29} IQR = 18 − 12 = 6

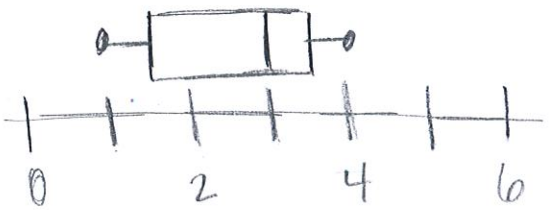



11.) {2,2,3,8,2,8,2,42}

IQR = 8 − 2 = 6




12.) {3,4,3,1,2} IQR = 3.5 − 1.5 = 2



**Find the variance and standard deviation.**

13.) {3,3,4,5,5}

Variance: $\sigma^2 = .79$

Standard deviation: $\sigma = .89$

14.) {10,12,14,15,18,20,23}

Variance: $\sigma^2 = 17.98$

Standard deviation: $\sigma = 4.24$

15.) {7,14,21,28,35,42}

Variance: $\sigma^2 = 142.92$

Standard deviation: $\sigma = 11.95$

16.) {4,4,4,4,5}

Variance: $\sigma^2 = .16$

Standard deviation: $\sigma = .4$

17.) {8,12,30,35,48,50,62}

Variance: $\sigma^2 = 343.71$

Standard deviation: $\sigma = 18.54$

18.) {14,26,40,52}

Variance: $\sigma^2 = 205$

Standard deviation: $\sigma = 14.32$

19.) **Measurement** Students in a fourth-grade class were asked to measure the widths of their desks in centimeters. They recorded the following measures: 49, 50, 49, 48, 49, (19), 50, 49, 48, 50, 49, and 50. Identify the outlier, and describe how it affects the mean and the standard deviation.

$\bar{X} = 46.6$

$\sigma = 8.4$

$3\sigma = 25.2$

21.4 — 46.6 — 71.8

$-3\sigma$ $\bar{X}$ $+3\sigma$

19 does not lie on this interval so outlier

Without outlier

$\bar{X} = 49.18$

$\sigma = .72$

20.) **Football** The 2004 Cincinnati Bengals scored 24, 16, 9, 17, 17, 23, 20, 26, 17, 14, (58), 27, and 28 points in their first 13 games. Find the mean and the standard deviation of the data. Identify the outlier, and describe how it affects the mean and the standard deviation.

$\bar{X} = 22.8$

$\sigma = 11.5$

$3\sigma = 34.5$

-11.7 — 22.8 — 57.3

$-3\sigma$ $\bar{X}$ $+3\sigma$

58 does not lie on this interval so outlier

Without outlier

$\bar{X} = 19.8$

$\sigma = 5.6$