

Directions: Complete each problem appropriately. Show work for the necessary problems.

- 1.) Find the measures of central tendency for following data set:
15, 13, 9, 9, 7, 1, 11, 10, 13, 1, 13, 8, 14.

$$\text{mean}(\bar{x}) \approx 9.5$$

$$\text{median} = 10$$

$$\text{mode} = 13$$

- 2.) Find the measures of central tendency for following data set:
100, 77, 82, 69, 84, 70, 100, 93, 80, 82, 83, 78, 70, 82, 89, 97, 71, 83, 93, 87, 83

$$\text{mean}(\bar{x}) \approx 83.5$$

$$\text{median} = 83$$

$$\text{mode} = 82 \text{ and } 83$$

- 3.) Complete following sentences with the word ALWAYS, SOMETIMES, or NEVER:

a.) A set of data ALWAYS has one and only one median.

b.) A set of data ALWAYS has one and only one mean.

c.) A set of data SOMETIMES has one and only one mode.

- 4.) Find the range and interquartile range for following set of data: 44, 45, 38, 8, 40, 35, 10, 55, 23, 96

$$\text{range} = \text{High\#} - \text{Low\#}$$

$$= 96 - 8 = \boxed{88}$$

$$\text{IQR} = Q_3 - Q_1$$

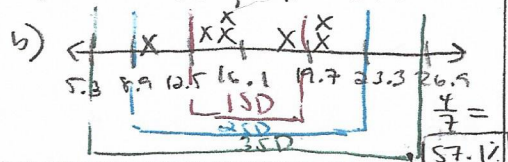
$$= 45 - 23 = \boxed{22}$$

- 5.) Using the data set:
20, 16, 18, 14, 9, 20, 16

a.) Find the mean and std dev.

b.) What percent of data falls within 1 std dev from the mean?

$$a) \bar{x} = 16.1, \sigma_x = 3.6$$



- 6.) Find the variance for following set of data: 9, 8, 10, 9, 8, 5.

$$\text{variance} = (\text{std dev})^2$$

$$\text{std dev}(\sigma_x) = 1.572330189$$

$$\text{variance} = (1.572330189)^2$$

$$\approx \boxed{2.472}$$

- 7.) What are the minimum and maximum (after factoring in any outliers) of following set of data:

24, 28, 10, 26, 35, 30, 31, 29?

min outlier max

$$Q_1 = 25 > \text{IQR} = 5.5$$

$$Q_3 = 30.5$$

$$LB = 25 - 1.5(5.5) = 16.75$$

$$UB = 30.5 + 1.5(5.5) = 38.75$$

$$\text{Min} = 24$$

$$\text{Max} = 35$$

- 8.) Find the outlier boundaries for following set of data: 55, 63, 91, 51, 78, 45, 48, 76, 99, 99

$$Q_1 = 51$$

$$Q_3 = 91 > \text{IQR} = 40$$

$$LB = 51 - 1.5(40) = -9$$

$$UB = 91 + 1.5(40) = 151$$

- 9.) Make a stem-leaf plot of following set of data:

70	80	80	80	74
80	80	70	64	78
73	78	74	45	81
48	80	82	82	70

Stem | Leaf

4 | 5 8
5 |
6 | 4
7 | 0 3 4 4 8 8 9 9
8 | 0 0 0 0 0 0 1 2 2

- 10.) Make a box-and-whisker plot of following set of data: 24, 18, 29, 21, 16, 23, 13, 11 IQR = 23.5 - 19.5 = 4

Make sure you check for outliers → no outliers

$$\text{Min} = 11$$

$$Q_1 = 14.5$$

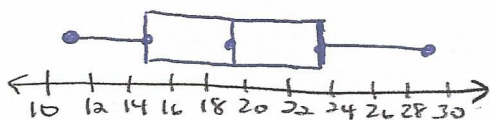
$$\text{Med} = 19.5$$

$$Q_3 = 23.5$$

$$\text{Max} = 29$$

$$LB = 14.5 - 1.5(4) = 1$$

$$UB = 23.5 + 1.5(4) = 37$$



- 11.) Make a box-and-whisker plot of following set of data: 74, 72, 35, 80, 70, 71, 72, 94, 75, 77.

Make sure you check for outliers IQR = 77 - 71 = 6

$$\text{Min} = 70$$

$$Q_1 = 71$$

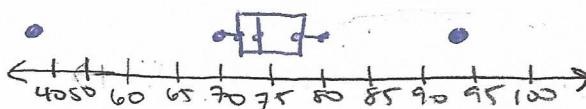
$$\text{Med} = 73$$

$$Q_3 = 77$$

$$\text{Max} = 80$$

$$LB = 71 - 1.5(6) = 62$$

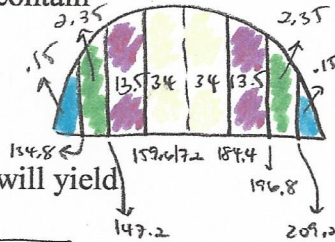
$$UB = 77 + 1.5(6) = 86$$



12.) A forest products company claims that the amount of usable lumber in its harvested trees averages 172 cubic feet and has a standard deviation of 12.4 cubic feet. Assume that these amounts have approximately a normal distribution.

a.) What percent of trees contain more than 159.6 ft³?

$$2(34) + 13.5 + 2.35 + .15 = 84\%$$



b.) What percent of trees will yield less than 147.2 ft³?

$$2.35 + .15 = 2.5\%$$

c.) If 12,000 trees are usable, how many trees yield between 134.8 and 196.8 ft³?

$$2.35 + 2(13.5) + 2(34) = 97.35\%$$

$$\rightarrow .9735(12000) = 11,682 \text{ trees}$$

13.) The scores on an exam are normally distributed with a mean of 77 and a standard deviation of 10. What percent of the scores are greater than 87?

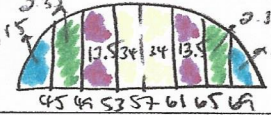
$$13.5 + 2.35 + .15 = 16\%$$



14.) The number of cookies in a shipment of bags are normally distributed with a mean of 57 and a standard deviation of 4. There are normally 500 bags of cookies in a shipment. How many bags of cookies will contain between 49 and 65 cookies?

$$2(34) + 2(13.5) = 95\%$$

$$\rightarrow .95(500) = 475 \text{ bags}$$

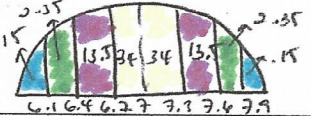


15.) Brenda's Bountiful Chocolate Bon-Bons are packaged in small bags. The weight of the bags are normally distributed with an average weight of 7 ounces and a standard deviation of 0.3 ounces. During a routine check, 8 of the bags had weights of more than 7.6 ounces. How many bon-bons were sampled?

$$2.35 + .15 = 2.5\%$$

$$\rightarrow .025x = 8$$

$$x = 320$$



16.) Although skim milk has as much calcium as whole milk, only 33% of 2406 adults surveyed in SHAPE magazine said skim milk is a good source of calcium. What is the margin of error for this survey? MOE = ?

$$MOE = 2 \sqrt{\frac{.33(1-.33)}{2406}}$$

$$= \text{about } 2\%$$

17.) A grocery store chain contacted a random group of customers who spent an average of at least \$100 on a weekly basis: 83% said they were "somewhat satisfied" with their store's service. The margin of error was 4.5%. How many customers were contacted by the researchers? n = ?

$$.045 = 2 \sqrt{\frac{.83(1-.83)}{n}}$$

$$(.0225) = \left(\sqrt{\frac{.1411}{n}}\right)^2$$

$$5.0625 \times 10^{-4} \times \frac{.1411}{n}$$

$$n = .1411$$

$$5.0625 \times 10^{-4} \times \frac{.1411}{n}$$

$$n = 279 \text{ customers}$$

18.) In a survey of U.S. citizens aged 65 and over, 399 people were asked about their participation in activities at their local Senior Citizen Center. The margin of error was 5%. How many said they participated in the survey?

$$.05 = 2 \sqrt{\frac{p(1-p)}{399}}$$

$$(y_2 = 0 \text{ for } T \pm)$$

$$(.025)^2 = \left(\sqrt{\frac{p-p^2}{399}}\right)^2$$

$$y_1 = x - x^2 = .249375$$

Find intersection or root...

$$6.25 \times 10^{-4} \times \frac{p-p^2}{399}$$

$$47.5\% \text{ or } 52.5\%$$

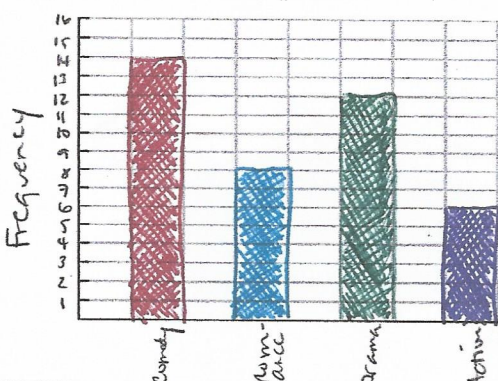
$$p - p^2 = .249375$$

$$p - p^2 - .249375 = 0$$

19.) A select group of 40 students were surveyed concerning their movie preferences. The table below shows the data that was collected:

Type	Comedy	Romance	Drama	Action
Percent	35%	20%	30%	15%

Make a bar graph that shows the data's FREQUENCY and not percent.



20.) Jared surveyed 50 of his classmates on their favorite color. Below are his survey results. Make a pie chart.

Orange	Yellow	Red	Blue	Totals
15	20	5	10	Total # = 50
30%	40%	10%	20%	Total % = 100%
108°	144°	36°	72°	Total Deg = 360°

