

**Topic 5: Using Samples to Predict**

15. A high school is conducting a survey to see how many students have part-time jobs. Determine whether the samples are biased or unbiased. Explain.

a) five random students in each homeroom

Unbias, every one is likely to be simple random chosen

b) every 10<sup>th</sup> student that enters a school football game

Biased, students could be from other school

c) 100 random students in the school parking lot

16. A bake shop surveyed a random group of customers to determine their favorite type of cheesecake. Results are shown below.

Cheesecake	Frequency
Strawberry	21
Red Velvet	16
Chocolate Fudge	28
Raspberry Truffle	12
Cookies & Cream	25
Peanut Butter Fudge	18

a) What percent reported Raspberry Truffle as their favorite?

$$\frac{12}{120} = \frac{P}{100} \quad P = 10\%$$

b) What percent reported Red Velvet or Peanut Butter Fudge as their favorite?

$$\frac{34}{120} = \frac{P}{100} \quad P = 28.3\%$$

c) Out of 800 people, how many would you expect to say their favorite cheesecake is Cookies & Cream?

$$\frac{25}{120} = \frac{x}{800} \quad x = 167 \text{ people}$$

**Topic 6: Measures of Central Tendency & Range**

Find the mean, median, mode(s), and range for each of the following data sets. Round to the nearest tenth if necessary.

17. The number of yards ran by a running back in each game of a season: {58, 59, 110, 70, 150, 140, 76, 85, 33, 103, 130, 27, 153, 128, 64}

27, 33, 58, 59, 64, 70, 76, 85, 103, 110  
128, 130, 140, 150, 153  
4  
153  
- 27  
126

18. The length of time, in minutes, it took each student in a class to complete a test: {42, 28, 31, 55, 42, 25, 48, 42, 36, 24, 36, 51, 58, 39, 30, 47}

24, 25, 28, 30, 31, 36, 36, 39, 42, 42, 42  
47, 48, 51, 55, 58

58  
- 24  
34

Mean	Median	Mode(s)	Range	Mean	Median	Mode(s)	Range
92.4	85	None	126	39.625	40.5	42	34

19. Bella and Isaac take a weekly quiz in their math class. Their grades on each of the ten first quarter quizzes are shown below. Find the difference in their mean score.

Bella	Grade	Isaac
###	100	
	90	
	80	
	70	
	60	
	50	

70%

20. Rick ran 7.1 miles on Monday, 3.5 miles on Tuesday, 9 miles on Wednesday, and 5.8 miles on Thursday. How many miles does he need to run on Friday to average 6 miles per run?

25.4  
29.1  
30.0  
- 25.4  
4.6  
4.6 miles

88      61

Topic 7: Mean Absolute Deviation

Find the mean absolute deviation of each data set. Round to the nearest tenth if necessary.

21. The age of each employee at a company: {22, 52, 24, 29, 40, 58, 36, 32, 45, 39, 42, 25}

22. The height, in feet, of five bridges in California:

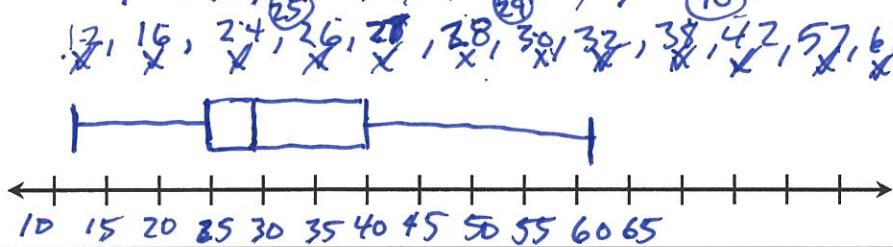
Foresthill	730
Pine Valley Creek	440
Cold Spring Canyon	420
Bidwell Bar	627
Golden Gate	746

23. Would the number of minutes of daylight each day for a month or the number of minutes of daylight each day for a year have a greater mean absolute deviation? Explain.

Topic 8: Box-and-Whisker Plots

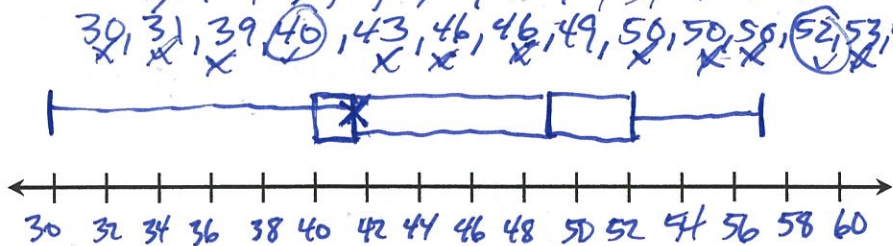
Find the five-number summary and construct the box-and-whisker plot for each data set.

24. The number of boxes of cookies sold by each girl in a girl scout troop: {26, 32, 12, 27, 16, 38, 61, 28, 42, 30, 57, 24}



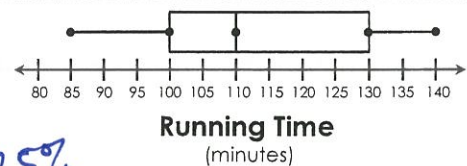
Minimum: 12  
 Lower Quartile: 25  
 Median: 29  
 Upper Quartile: 40  
 Maximum: 61

25. The distance, in yards, of the last 15 field goals successfully made by a kicker: {50, 52, 53, 43, 31, 39, 50, 49, 40, 46, 57, 55, 50, 30, 46}



Minimum: 30  
 Lower Quartile: 40  
 Median: 49  
 Upper Quartile: 52  
 Maximum: 57

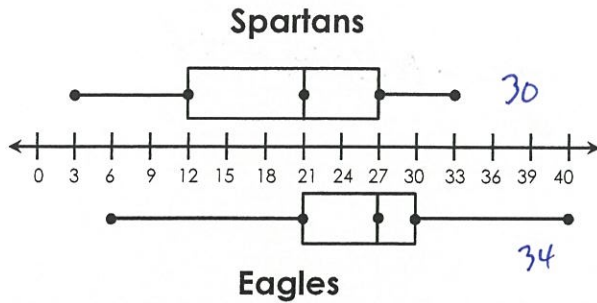
26. The running time, in minutes, of 20 movies, each with a different running time, is shown to the right.



- a) What is the interquartile range? 30 min
- b) What percent of the movies are at least 130 minutes? 25%
- c) What percent of the movies are between 100 and 140 minutes? 75%
- d) How many movies are less than 110 minutes? 10
- e) How many movies are between 100 and 110 minutes? 5



27. The number of points scored by two football teams in each of their 12 games is shown below. Both teams scored a different number of points in each of their games.



a) Which team had a greater range?

Eagles

b) What is the difference in their maximum score?

$$40 - 33 = 7$$

c) What is the total number of games that the Spartans and the Eagles scored at least 21 points?

$$6 + 9 = 15 \text{ games}$$

Topic 9: Scatter Plots & Line of Best Fit

Determine whether the data would have a positive, negative, or no relationship.

28. The number of songs on an iPod versus its remaining storage.

Negative

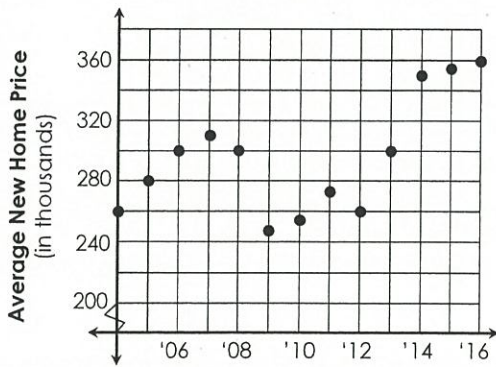
29. The age of a car versus its odometer reading.

Positive

30. The height of a high school student versus their SAT score.

No Relationship

31. The graph below shows the average price of a new home in a certain city each year since 2004. Use the graph to answer the questions.



a) In what year(s) was the average new home price \$300,000?

2006, 2008, 2013

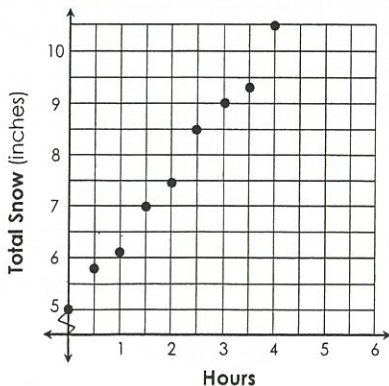
b) What was the approximate average new home price in 2014?

\$350,000

c) Describe the change in the average new home price from 2008 to 2009.

-\$50,000

32. Ashley measured the total snow in her yard every 30 minutes after a snowstorm started. The graph below shows her findings:



a) Which line best represents this data?

~~A)  $y = -\frac{3}{4}x + 5$~~

~~C)  $y = \frac{3}{4}x + 5$~~

~~B)  $y = -\frac{4}{3}x + 5$~~

**D)  $y = \frac{4}{3}x + 5$**

b) Using the line of best fit from part a, predict the total amount of snow after six hours.

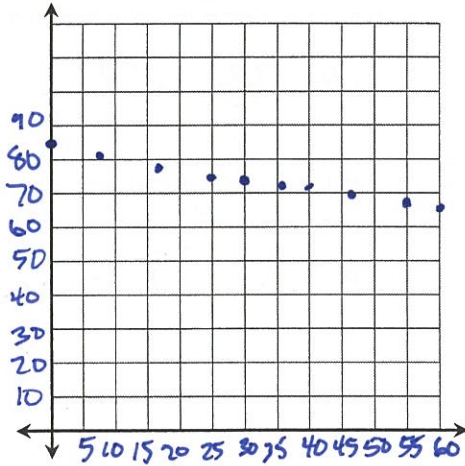
$$y = \frac{4}{3}(6) + 5$$

$$y = 8 + 5 = 13 \text{ inches}$$

33. The table below shows the temperature of a lake at certain depths.

Depth (ft)	0	8	18	25	30	36	40	47	55	60
Temperature (°F)	84	81.5	79	76.5	75	73	72	70	67.5	66

a) Draw a scatter plot to show the relationship.



a) Write an equation for the line of best fit.

$$y = -0.301x + 84$$

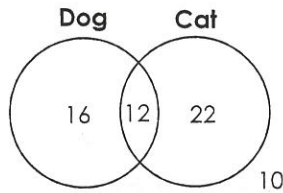
b) Estimate the temperature of the lake at 90 feet.

$$y = -0.301(90) + 84$$

$$y = 56.91^\circ\text{F}$$

Topic 10: Two-Way Tables & Relative Frequency

34. The Venn diagram below shows the results of a survey in which a group of students were asked if they have a dog and if they have a cat. Complete the two-way table.



	Cat	No Cat	Total
Dog	12	16	28
No Dog	22	10	32
Total	34	26	60

35. The partial table below shows the number of medals won in mens, womens, and mixed team events by the United States in the 2016 Summer Olympics. Complete the table, then answer the questions that follow.

	Gold	Silver	Bronze	Total
Men	18	18	19	55
Women	27	17	17	61
Mixed	1	2	2	5
Total	46	37	38	121

a) How many bronze medals did the United States win in women's events?

17

b) How many total medals were won?

121

36. Complete the relative frequency table using the data from question 35. Round to the nearest hundredth if necessary. Then answer the questions that follow.

	Gold	Silver	Bronze	Total
Men	0.15	0.15	0.15	0.45
Women	0.22	0.14	0.14	0.50
Mixed	0.01	0.02	0.02	0.05
Total	0.38	0.31	0.31	1

a) What percent of the medals won were in men's events?

45%

b) What percent of the medals won were women's event gold medals?

22%