Statistics

Summer Packet

Due August 28, 2018

**Please complete neatly and show all work!*

Math Help Websites:

The internet has a vast amount of resources. To utilize your search in an efficient manner, enter the specific topic skill listed below to narrow your results.

http://www.coolmath.com
http://www.aplusmath.com
http://www.mathplayground.com
http://www.purplemath.com
http://www.ixl.com
http://softschools.com
http://math.com/homeworkhelp
http://kidsmathgamesonline.com
http://learnzillion.com
www.mrmathblog.com

http://www.khanacademy.org (great videos to help you if you get stuck)!

Perform the indicated operation. Show ALL work.

$3\frac{1}{2} + 6\frac{2}{3}$

$2\frac{3}{5} + 10\frac{1}{7}$

$9\frac{2}{9} + 5\frac{3}{8}$

$5\frac{2}{3} - 2\frac{1}{4}$

$6\frac{4}{5} - 2\frac{9}{10}$

$8 - 5\frac{4}{7}$

$4 \bullet \frac{6}{11}$

$\frac{2}{3} \bullet \frac{5}{9}$

Perform the indicated operation. Show ALL work.

$3\frac{1}{5} \cdot \frac{3}{8}$

$\frac{4}{9} \cdot 2\frac{1}{7}$

$8\frac{1}{3} \div 5$

$\frac{9}{14} \div \frac{2}{3}$

$6\frac{1}{4} \div 2\frac{1}{8}$

PROBABILITY

Objective: To find the probability that an event will occur.

EXAMPLE

A glass bowl contains 4 red marbles, 3 blue marbles, and 1 white marble. A marble is drawn at random from the bowl. Find the probability of each event.

a. Event A: The marble drawn is red.
b. Event B: The marble drawn is either red or blue.
c. Event C: The marble drawn is not red.
d. Event D: The marble drawn is green.

Solution:

a. Since there are 4 red marbles, Event A has 4 equally likely outcomes. So $P(A) = \frac{4}{8} = \frac{1}{2}$.

b. Since there are 4 red marbles and 3 blue marbles, Event B has 7 equally likely outcomes. So $P(B) = \frac{7}{8}$.

c. If a marble is not red, then it must be either blue or white. Since there are 3 blue marbles and 1 white marble, Event C has 4 equally likely outcomes. So $P(C) = \frac{4}{8} = \frac{1}{2}$.

d. Since there aren't any green marbles, Event D is an impossible event so $P(D) = 0$.

Solve. Show ALL work.

1. A jar contains 4 red marbles, 5 white marbles, and 3 blue marbles. A marble is drawn at random from the jar. Find the probability of each event.

   a. The marble is red.
   b. The marble is white.
   c. The marble is either red or white.
   d. The marble is black.
   e. The marble is either red, white, or blue.

2. A cube whose sides are numbered 1, 2, 3, 4, 5, and 6 is rolled. Find the probability of the event that the number on the cube is:

   a. 4
   b. 3 or 6.
   c. greater than 2.
   d. greater than 1 but less than 4.

3. One card is drawn at random from a standard deck of 13 hearts, 13 diamonds, 13 clubs, and 13 spades. Find the probability of the event that the card is:

a. an ace.

b. a black 2.

c. a spade.

d. the jack of diamonds.

e. a 2 or 3.

f. an ace, king, or queen.

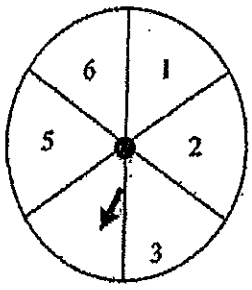
4. A spinner has six equal sections numbered 1, 2, 3, 4, 5, and 6. The pointer on the spinner is spun. Find the probability of each event.

a. The pointer stops on an odd number.

b. The pointer stops on a number less than 4.

c. The pointer stops on a multiple of 2.

d. The pointer stops on a perfect square.



4

FREQUENCY DISTRIBUTIONS

Objective: To recognize and analyze a frequency distribution.

EXAMPLE

The top speeds in miles per hour of ten animals are listed in increasing order:

1, 18, 25, 32, 32, 35, 43, 50, 64, 70

Find the mean, median, mode, and the range of the data.

Solution:

$$Mean = \frac{1+18+25+32+32+35+43+50+64+70}{10} = \frac{370}{10} = 37$$

$$Median = \frac{32+35}{2} = \frac{67}{2} = 33.5$$ (to find the median the numbers must be put in numerical order)

Since 32 is the score that occurs the most frequently, 32 is the *Mode*.

$Range = 70 - 1 = 69$

For each set of data for problems #1 – 8, find the mean, median, mode, and range. Show ALL work.

1. 21, 50, 35, 49, 35

2. 8, 16, 43, 32, 16

3. 37, 36, 27, 38, 38, 32, 23

4. 13, 8, 12, 8, 12, 8, 16

5. 51, 43, 42, 46, 51, 46, 53

6. 70, 76, 64, 46, 80, 48, 64

7. In six football games, the Tigers scored 28, 32, 21, 28, 42, and 12 points.

8. In a class of 15 students, the test scores were 80, 97, 93, 98, 100, 90, 67, 78, 96, 92, 85, 87, 83, 88, and 91.

DATA ANALYSIS

Objective: a. To create a box and whisker plot given a set of data.
b. To find the mean, median, mode, and range of a stem-and-leaf plot.

Example for Objective a.

Draw the box-and-whisker plot for the following data set:

79, 77, 87, 86, 99, 87, 80, 94

Solution

Start by putting the data in numerical order.

77, 79, 80, 86, 87, 87, 94, 99

Find the median, or the middle. Since there are eight data points, the median will be the average of the two middle values: $(86 + 87) \div 2 = 86.5 = Q_2$

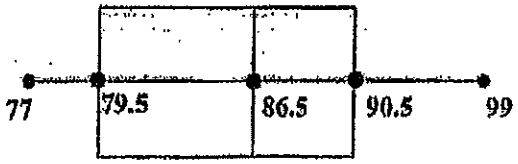
This splits the list into two halves: 77, 79, 80, 86 and 87, 87, 94, 99. Find the median, or middle of each half. Since the halves of the data set each contain an even number of values, the sub-medians will be the average of the middle two values.

$Q_1 = (79 + 80) \div 2 = 79.5$
$Q_3 = (87 + 94) \div 2 = 90.5$

The minimum value is 77 and the maximum value is 99, so you have:

min: 77, Q_1: 79.5, Q_2: 86.5, Q_3: 90.5, max: 99

Plot each of these five numbers on a number line. The "box" part of the plot goes from Q_1 to Q_3.



And then the "whiskers" are drawn to the endpoints.

Example for Objective b.

Find the mean, median, mode, and range of the following stem-and-leaf plot:

The number 38 would be represented as

Stem	Leaf
3	8

Math Test Scores (out of 50 pts)	
Stem	Leaf
3	4 6 8
4	0 2 2 4 5 5 7 8 9
5	0 0 0

Therefore the scores represented in this stem-and-leaf are:

34, 36, 38, 40, 42, 42, 44, 45, 45, 47, 48, 49, 50, 50, 50

Solution

$$\textit{Mean} = \frac{34+36+38+40+42+42+44+45+45+47+48+49+50+50+50}{15} = \frac{660}{15} = 44$$

Median = 45 *(middle)*

Since 50 is the score that occurs the most frequently, 50 is the *Mode.*

Range = 50 − 34 = 16

Definitions:

Mean – the average of all the numbers
Median – the middle number of a set of numbers in order from smallest to largest
Mode – the number that appears most often
Range – the difference between the largest and smallest numbers
Interquartile range – the difference between Q_1 and Q_2

A. Use the space provided to create a box and whisker plot for the set of data and answer the questions that follow. Show ALL work.

4.3, 5.1, 3.9, 4.5, 4.4, 4.9, 5.0, 4.7, 4.1, 4.6, 4.4, 4.3, 4.8, 4.4, 4.2, 4.5, 4.4

1. Mean =

2. Range =

3. Interquartile range =

B. Create your own stem-and-leaf plot with the following temperatures for June. Show ALL work.

Find the mean, median, mode, and range for the following stem-and-leaf plot:

77, 80, 82, 68, 65, 59, 61, 57, 50, 62, 61, 70, 69, 64, 67, 70, 62, 65, 65, 73, 76, 87, 80, 82, 83, 79, 79

1. Mean =

2. Median =

3. Mode =

4. Range =

Finding Quartiles

Name:

d the 1st, 2nd (median) and 3rd quartile of the set of numbers.

Ex) 21 , 72 , 43 , 86 , 21 , 35 , 23 , 48 , 78
21 , 21 | 23 , 35 ; 43 , 48 , 72 | 78 , 86

1) 91 , 91 , 91 , 97 , 65 , 37 , 41 , 76 , 87

2) 7 , 4 , 5 , 2 , 7 , 7 , 2

3) 2 , 4 , 7 , 3 , 10 , 2 , 8 , 7

4) 89 , 36 , 49 , 98 , 40 , 79 , 28 , 86

5) 2 , 7 , 10 , 10 , 1 , 7 , 10

6) 48 , 95 , 73 , 39 , 78 , 41 , 89 , 29 , 95

7) 42 , 30 , 79 , 99 , 72 , 24 , 89 , 91 , 78 , 69

8) 9 , 3 , 6 , 2 , 6 , 1 , 7 , 8 , 8

) 76 , 81 , 37 , 34 , 48 , 86 , 78 , 25 , 53 , 78 , 21

) 7 , 3 , 9 , 3 , 8 , 1 , 10

) 58 , 95 , 21 , 37 , 70 , 74 , 92 , 73 , 94 , 21

1 , 2 , 7 , 10 , 2 , 10 , 5 , 7 , 8

Answers

Ex. 22 43 75

1. ___ ___ ___
2. ___ ___ ___
3. ___ ___ ___
4. ___ ___ ___
5. ___ ___ ___
6. ___ ___ ___
7. ___ ___ ___
8. ___ ___ ___
9. ___ ___ ___
10. ___ ___ ___
11. ___ ___ ___
12. ___ ___ ___

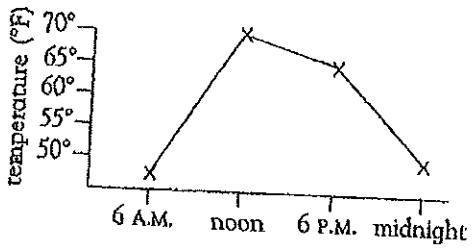
Looking at graphs

Derek recorded the temperature in his garden during one day.
At what time was the temperature at its highest?

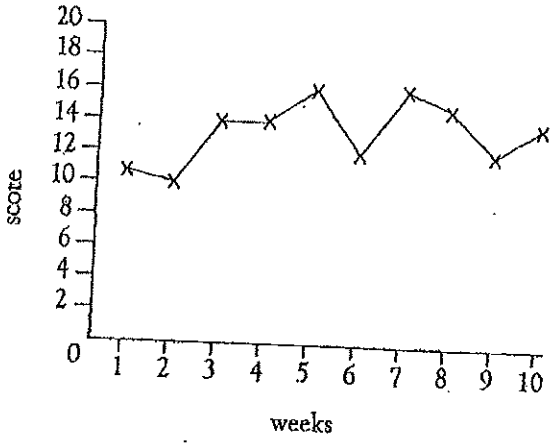
noon

By how much did the temperature fall between 6 P.M. and midnight?

10°F



Kate keeps a record of her last 10 spelling test scores.



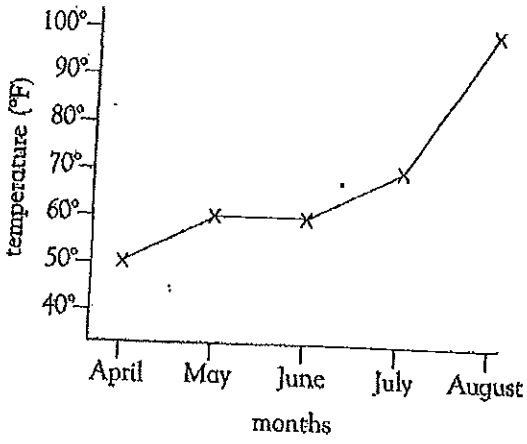
What was Kate's score in week 3?

In which 2 consecutive weeks did Kate's score stay the same?

What was Kate's best score?

How much did her score improve between weeks 4 and 5?

The local tourist board produced a graph to show the maximum temperatures in Charleston between April and August.



What was the maximum temperature in April?

Overall, what is happening to the temperature between April and August?

How much did the temperature rise between May and July?

Which two months had the same maximum temperature?