

Name: _____

Date: _____



STATISTICAL QUESTIONS AND MEASURES N-GEN MATH[®] 7



Statistics is a branch of **applied math** that answers questions where **variability** is part of the answer. **Variability** is simply the differences between values in a **data set**.

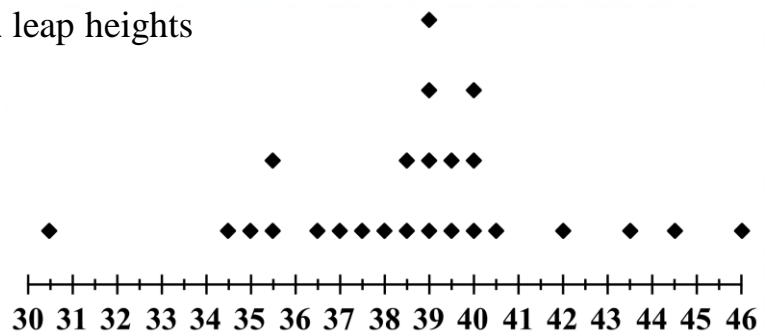
Exercise #1: How high someone can jump from a standstill is known as their **vertical leap height**. Which of the following questions below is a **statistical question**? Explain your choice.

- (1) What is Zion Williamson's maximum vertical leap height? (2) How high can professional basketball players leap?

We can start to answer **statistical questions** by **collecting** and **analyzing data**. This analysis can involve **graphical displays** of the data and **statistical measures**.

Exercise #2: The vertical leap heights of 25 professional basketball players is shown below on the line graph (also known as a dot plot). Answer the following questions.

- (a) What were the **minimum** and **maximum** leap heights in this data set?



- (b) What is the **range** of this data set?

- (c) What is the **mode** of this data set?



The **mode** from *Exercise #2* is a measurement of the **center** of a data set. The other two common statistical **measures of center** are the **median** and the **mean**.

MEASURES OF CENTER

The **center** of a data set is a **single value** that serves to represent a “typical” value of the data set. The three most common measurements of the center are shown below.

1. The **mode**: the data value that occurs the most.
2. The **median**: the data value that lies at the middle of the data set if placed in order.
3. The **mean**: the average of the data values found by summing and dividing by the number of values.

Exercise #3: The weights of 15 kittens at a pet shelter are shown below in ounces:

7, 7, 9, 10, 10, 11, 13, 13, 13, 14, 14, 18, 20, 23, 25

When all 15 kittens were weighed together, their total weight was 207 ounces.

- (a) What is the median weight of the kittens? (b) Is the mean weight of the kittens greater than, less than, or equal to the median weight? Justify.

The **median**, or “middle number”, is sometimes tricky to find if the data set has an even number of values in it. In this case we simply find the average of the two numbers most close to the center.

Exercise #4: Eight cousins attended a family gathering. Their ages are shown below in **ascending order** (increasing order).

3, 3, 5, 8, 9, 12, 12, 14

- (a) What is the median age of the cousins? (b) What is the mean age of the cousins?

- (c) This data set is considered **bimodal**. What do you think this term means?



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STATISTICAL QUESTIONS AND MEASURES
N-GEN MATH[®] 7 HOMEWORK

FLUENCY

1. In the data set shown below, which of the following is the mode?

(1) 9

(3) 12

4, 9, 9, 9, 10, 12, 12, 14, 17

(2) 10

(4) 13

2. Which of the following is closest to the mean of the data set shown?

(1) 16.8

(3) 17.7

11, 15, 17, 19, 20, 24

(2) 17.1

(4) 18.2

3. The median of the data set shown below is which of the following?

(1) 24

(3) 26.5

18, 21, 24, 27, 31, 33

(2) 25.5

(4) 27

4. For the following data set, which of the following statements is true?

(1) mode > median

16, 16, 16, 18, 22, 25, 29

(2) mean > median

(3) mode = median

(4) mode = mean

5. What is the range of the data set shown below?

(1) 16

(3) 28

15, 9, 22, 37, 18, 22, 31

(2) 22

(4) 37



USING YOUR MATH

6. Michael is thinking about how old professional tennis players are. He is considering investigating the following two questions.

Question A: How old is the oldest current professional tennis player?

Question B: How old are professional tennis players?

Which of these two questions is a statistical question and why?

7. Michael collects the ages of 15 professional tennis players and arranges them in ascending order. The data set he collects is shown below.

16, 19, 20, 23, 23, 23, 27, 27, 29, 30, 31, 31, 32, 34, 35

The sum of all the ages in this sample was 400.

Is the mean, median, or mode the greatest for this data set? Justify your response.

8. Maria would like to answer the question “How cold is it in January in New York?”

(a) Why is this a question that statistics should be used to answer?

(b) Maria takes a sample of 10 temperatures from January:

18, 23, 26, 26, 28, 31, 33, 33, 37, 41

What is the median of this data set?

