Data Presentation

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May 4, 2018

Data is only as good as how it is presented. How do you take hundreds or thousands of data points and create something a human can understand? This is a problem set to understand different types of data presentation.

Tables

Age Group	Percentage
0-9	20%
10-19	18%
20-29	15%
30-39	P%
40+	Q%

The above table shows the percentage of citizens in a given country that are in a certain age group. If 38% of the population are aged 40 and over, what would be the value of P?

What percentage of the population is aged 30 and above?

- 47%
- 62%
- 35%
- 53%

Number of Peas	Number of Pods
0	0
1	4
2	13
3	20
4	X

In the above table, students recorded down the number of peapods which had a certain number of peas in them. It was discovered that no pea pod had 5 or more peas. How many of the peapods had 2 or fewer peas in them?

- 4
- 17
- 13
- 37

# days	# workers
0	40
1	4
2	3
3	0
4	0
5	20

The above table represents the number of days that workers in a company drive to work in the past 5 work days. How many workers are there in the company?

Hours spent	# students
< 1 hour	3
1-2 hours	7
2-3 hours	10
> 3 hours	N

Stella polled her class of 43 students and asked them for the time that they spent watching television each day. How many students spent 2 to 3 hours watching television?

- 7
- 10
- 3
- 23

Two Way Tables

The following two-way table represents a class of students:

	Boys	Girls
Tall	7	4
Short	3	7

How many tall boys are in the class?

- 11
- 3
- 7
- 4

The following two-way table represents the cars in a small parking lot one morning,

	White	Red	Blue
Small	7	6	9
Large	6	5	7

If I see a person walking toward the lot and assume they will get into a random car that is parked there, what is probability they will choose a large, red car?

- 1/4
- 1/10
- 1/8
- 3/20

If I turn away for a second, and then see a blue car leave the parking lot (the time interval was too short for multiple cars to leave, and we can assume any car from the parking lot was just as likely to leave), what is probability that it was a small car?

- 9/16
- 11/20
- Not enough information
- 13/24

The following two-way table represents a class of 90 students that has more girls than boys:

	Boys	Girls
Passed	25	
Failed		10

However, some of its entries have been erased and are missing. If we know that in this class, a randomly chosen boy and a randomly chosen girl both have the same probability of passing, how many boys who failed are there?

- 5
- 10
- 15
- 20
- 25
- 50

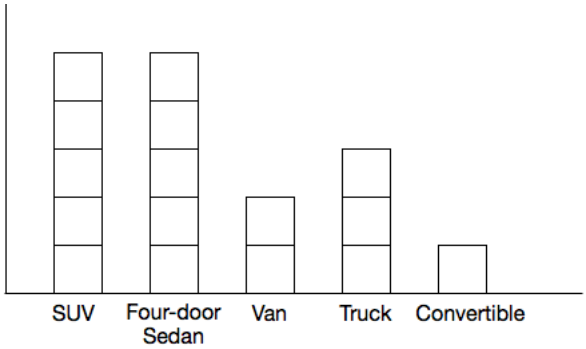
The following two-way table represents the animals seen in a park one evening,

	Dogs	Cats
Big	8	4
Small	7	26

At this park, how many times larger is the probability that a random dog is big than the probability that a random cat is big?

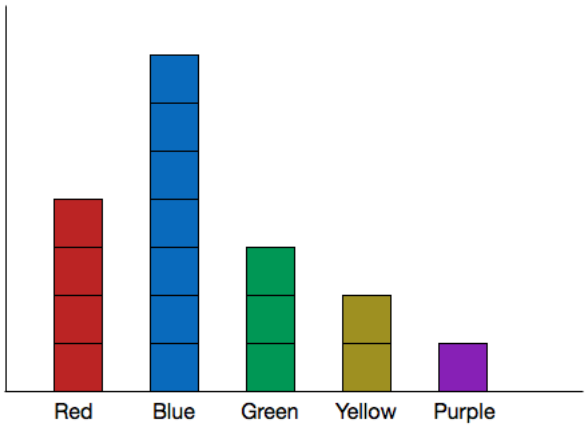
- they are the same
- three times as big
- four times as big
- twice as big

Bar Charts



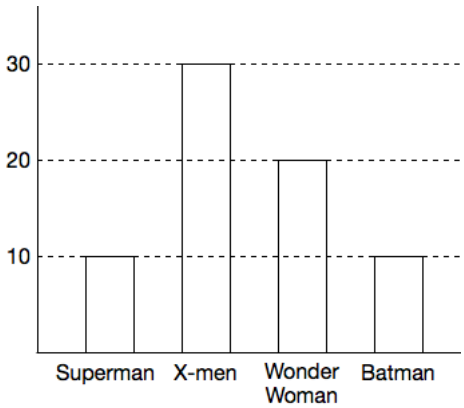
The above bar chart shows the number of vehicles that were sold at a dealership in the month of October. If each square represents 8 vehicles, how many vehicles will sold?

If a total of 224 vehicles were sold, how many vehicles does each square represent?



The above bar chart represents the favorite colors of a group of middle-school children. If there are 136 children who responded, how many children does each square represent?

- 1
- 7
- 8
- 9



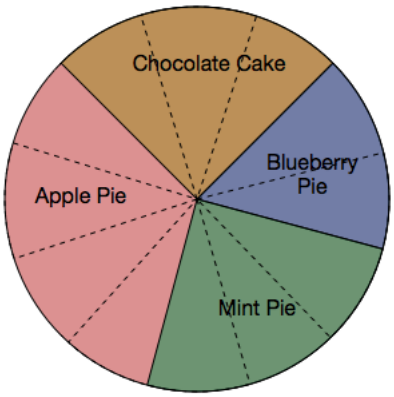
The above bar chart shows the number of comics that are sold in a bookstore on July 1st. How many Wonder Women comic books were sold?

- 0
- 20
- 30
- 10

Which comic book sold the most copies?

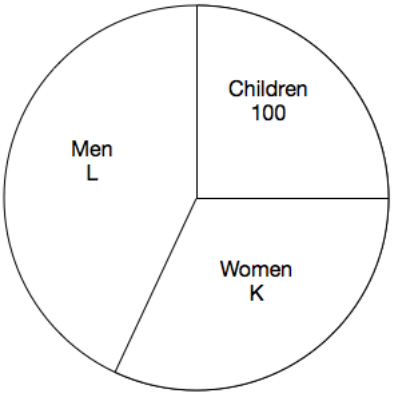
- Superman
- X-men
- Wonder Woman
- Batman

Pie Charts

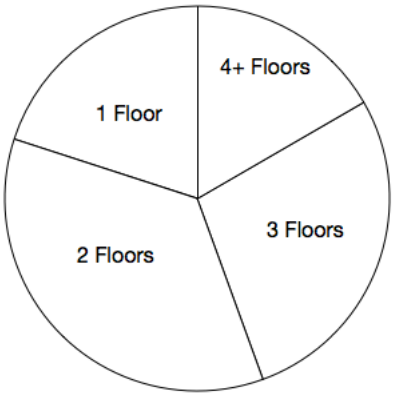


The above pie chart (where each dotted slice represents a fixed number of pies) shows the number of desserts that are sold in a diner. If 12 pies were sold, how many apple pies were sold?

If 26 blueberry pies were sold, how many chocolate cakes were sold?

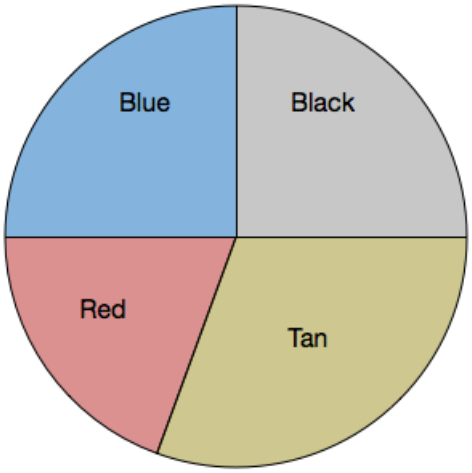


At a country fair, 1/4 of the attendees were children. How many people attended the fair?



The above pie chart shows the distribution of the number of floors in homes of a certain city. What is the mode of this distribution?

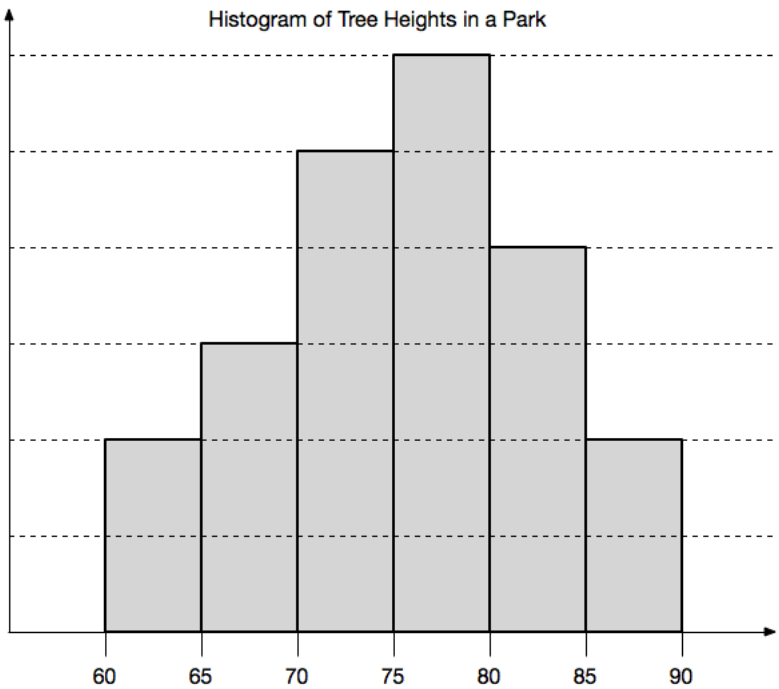
- 2 Floors
- 3 Floors
- 4+ Floors
- 1 Floor



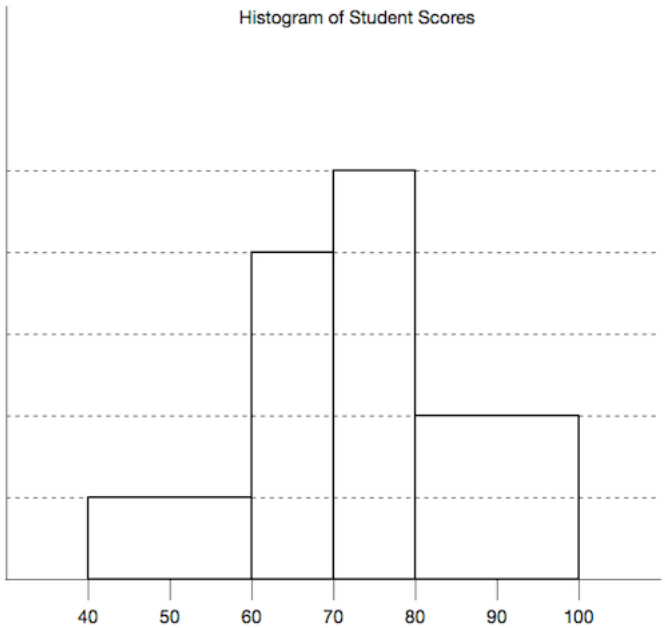
The above pie chart represents the distribution of socks that are in a drawer. What other color has an equal number of socks as blue?

- Tan
- Black
- Red
- None

Histograms



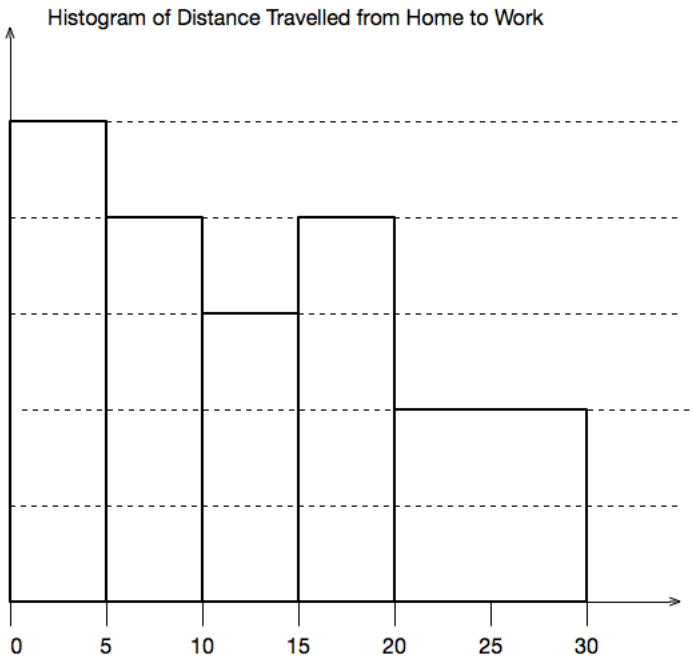
The above histogram shows the height of trees (in feet) in a park. If there are 12 trees that have a height of 85 to 90 feet, how many trees are there in the park?



The above histogram shows the test scores of students in a class. If 28 students scored from 40 to 60, how many students scored between 70 and 80?

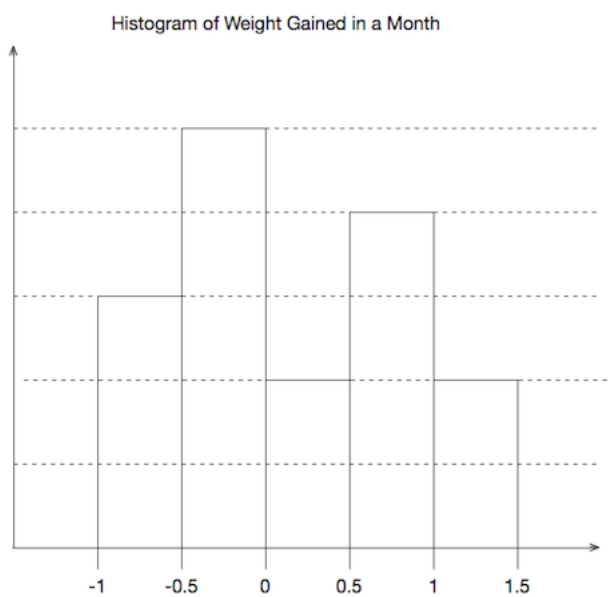
- 70
- 140

- 14
- 210



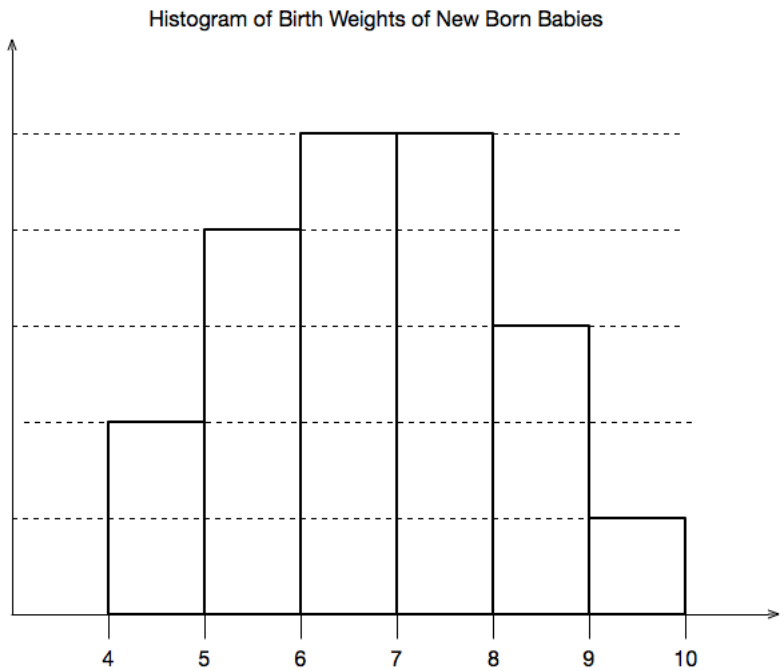
The above histogram shows the distance travelled (in miles) from home to work by the inhabitants of a certain town. If 284 people travelled between 5 and 10 miles, how many people travelled between 20 and 30 miles?

- 71
- 568
- 142
- 284



The above histogram shows the amount of weight gained by members of a gym in the month of January. If there are 208 members in the gym, how many of them lost weight in January?

- 26
- 65
- 104
- 39

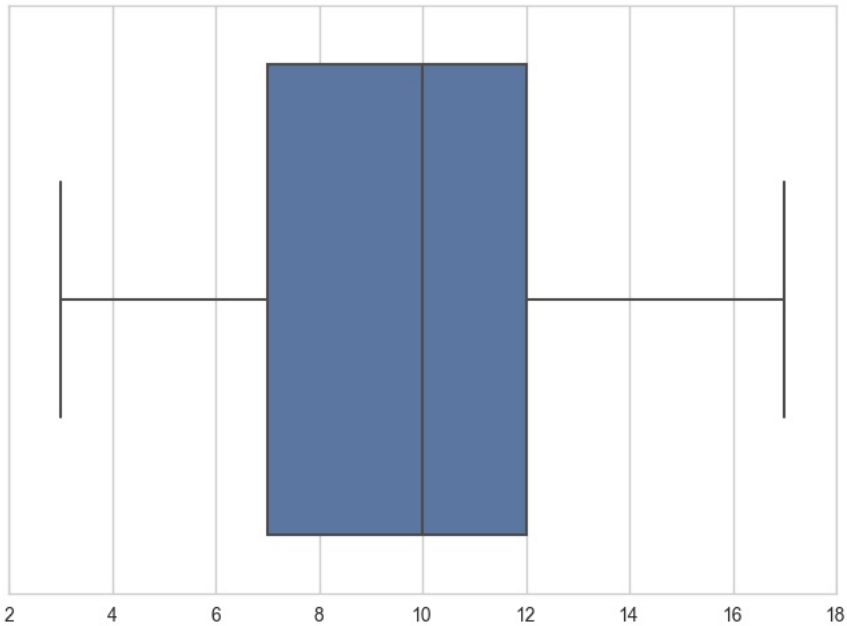


The above histogram shows the birth weight (in pounds) of newborn babies at a hospital. A baby that is under 5 pounds is considered underweight, and a baby that is over 9 pounds is considered overweight.

What percentage of babies are neither overweight nor underweight?

- 100%
- 85%
- 50%
- 15%

Box Plots



Which of the following is closest to the largest value in the data set represented by the box plot above?

- 12
- cannot tell
- 17
- 10
- 18

Consider the box plot above which was generated from a set of 9 values. If the largest possible mean of the numbers (i.e. their arithmetic average) is m, which is closest to $9m$?

Hint: think of what values the box plot tells us must be in the data set.

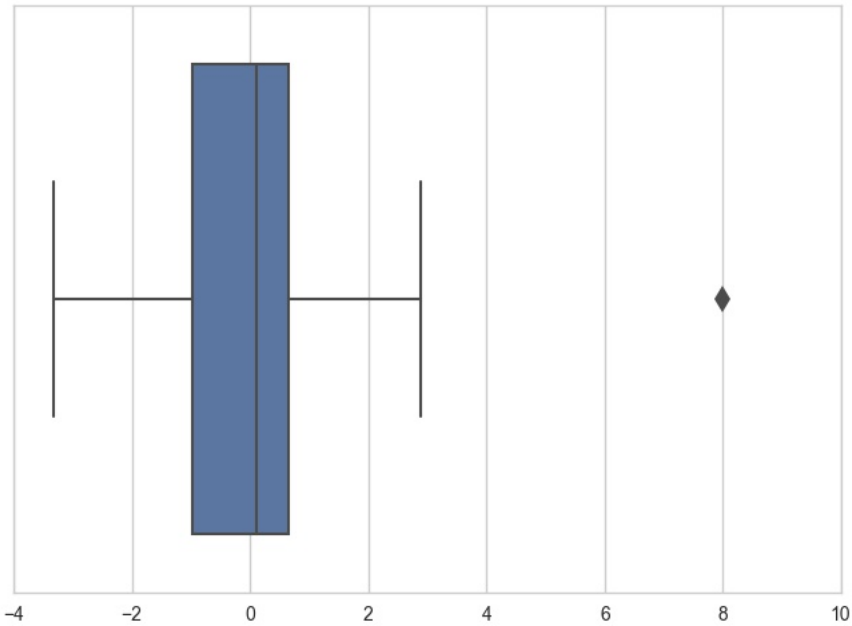
- 73.5
- 85
- 88.2
- 90
- 95

What is the mean of the numbers in the data set represented by the box plot above (note: the mean of some numbers is the arithmetic average of them)?

- 9.5
- 9.8
- 10
- 11
- cannot tell

Let the box plot above represent a very big data set. Which is the closest to the percentage of the data points in the set of data that are less than or equal to 7?

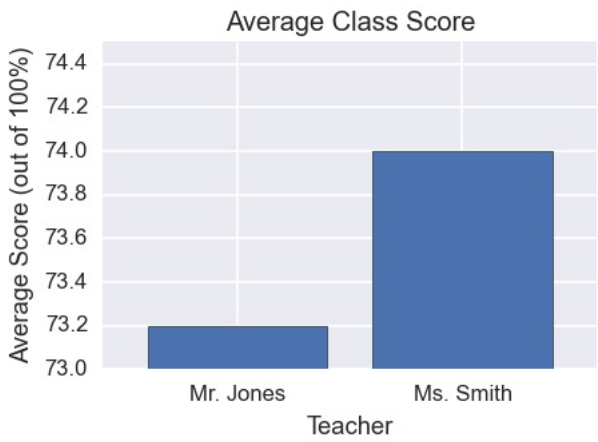
- 25
- 29
- 33
- 35



The box plot above represents a series of measurements. Which is closest to the largest measurement?

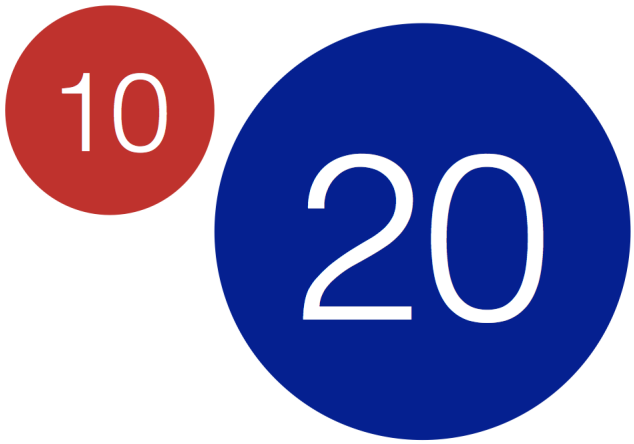
- 8
- 0.5
- 6
- 3
- 4

Misleading Graphs



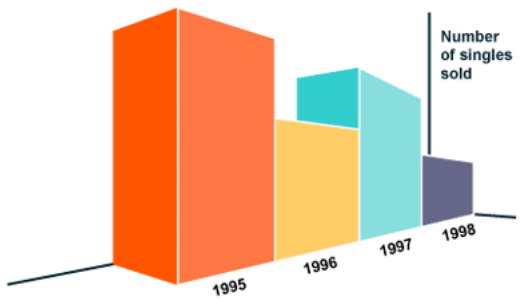
Mr. Jones and Ms. Smith each teach a Calculus class at a local high school. Each of their students take a county-mandated final exam at the end of the year. Ms. Smith plots both of their average scores in the graph above. Is there anything that makes the graph misleading or unclear?

- No, the graph is fine
- Yes, it is improperly labeled
- Yes, the bars should be different colors
- Yes, the y scale used is too small and does not start at 0



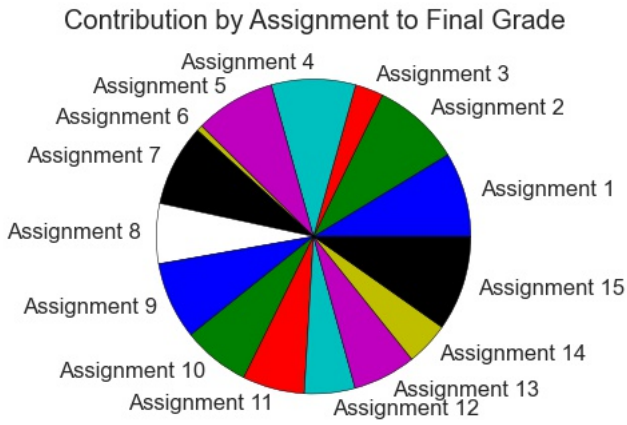
Mr. Jones is not pleased with Ms. Smith for how often she rubs in her better average. He therefore decides to make the above visual that represents his and her class size. He has a class size of 20, and she has a class size of 10. Is his visual misleading or unclear?

- No, his visual is fine
- Yes, the big circle is more than twice as big as the small circle
- Yes, it is unclear, his visual does not present the numerical data
- Yes, the color difference is misleading



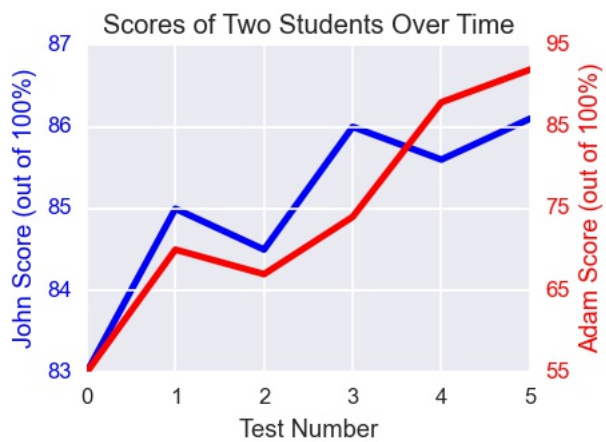
Consider this graph representing how the real estate industry is doing over time. Is there anything misleading or unclear about this graph?

- Yes, the colors are too different
- Yes, the 3D perspective skews sizes
- No, the graph is fine
- Yes, the bars are ambiguously labeled



Mr. Jones wants to explain to his class just how much each assignment will contribute to their final grade, so on his syllabus, he puts the pie chart from above. Is there anything misleading or unclear about it?

- Yes, the graph is inappropriately labeled
- Yes, it is hard to compare the sizes of slices when they are that thin
- Yes, the repeating colors are misleading
- No, the graph is fine



Two students in math class, John and Adam, decide to compare their scores on all the tests thus far on a line graph. Is there anything misleading or unclear about it?

- Yes, the use of different scales is misleading
- Yes, the graph is improperly labeled
- No, the graph is fine
- Yes, the lines overlap

Problem Solving - Basic

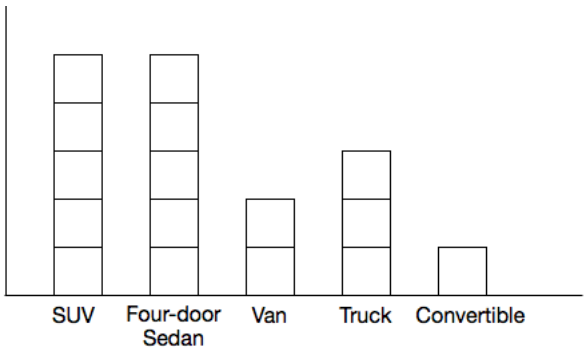
Hours spent	# students
< 1 hour	3
1-2 hours	7
2-3 hours	10
> 3 hours	N

Stella polled her class of 45 students and asked them for the time that they spent watching television each day. What is the value of N?

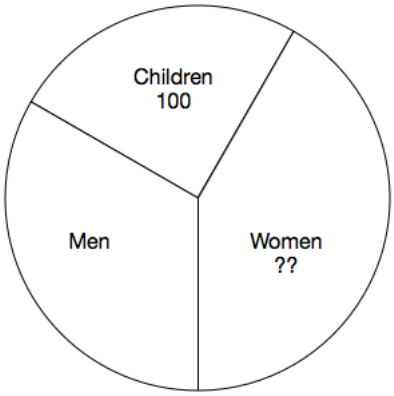
- 7
- 10
- 25
- 3

Stella polled her class of 26 students and asked them for the time that they spent watching television each day. What is the mode of this distribution?

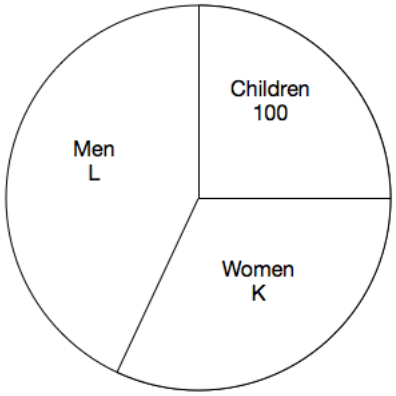
- 2-3 hours
- >3 hours
- <1 hour
- 1-2 hours



The above bar chart shows the number of vehicles that were sold at a dealership in the month of October. If each square represents 13 vehicles, how many more trucks were sold than convertibles?



At a country fair, 1/4 of the attendees were children. If there are 180 men who attended, how many more men than women attended?



At a country fair, 1/4 of the attendees were children. If there are 114 men who attended, how many women attended?