A frequency distribution lists the <u>number</u> of occurrences of each category.
Relative Frequency distribution lists the <u>proportion</u> of occurrences of each category.
Relative frequencies must add up equal 1.

1. A phlebotomist draws the blood of a random sample of 50 patients and determines their blood types as shown.

Construct a frequency distribution.

O	A	A	A	O
B	O	B	A	O
AB	AB	A	B	B
O	O	O	A	O
AB	O	A	B	A
A	A	A	O	O
O	A	O	B	A
O	AB	A	A	O
O	A	O	O	O
O	A	O	A	O

Open in StatCrunch
Copy to Clipboard
Open in Excel

Blood Type	Frequency
A	☐
AB	☐
B	☐
O	☐

(Type whole numbers.)

GRAPH – BAR PLOT- WITH DATA   Display value above bar

Bar Plot With Data

Select Column(s):
var1   var1

Where:
--optional--   Build

Group by:
--optional--

Grouping options:
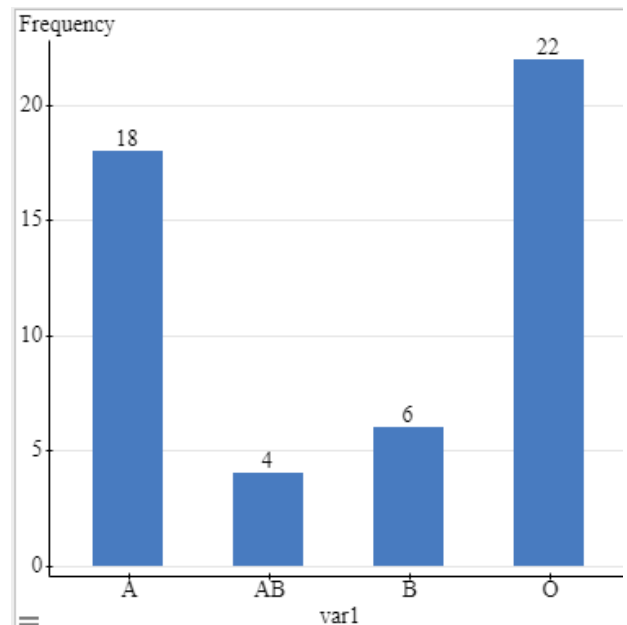Split bars

Type:
Frequency

Order by:
Value Ascending

"Other*" if percent less than:
--optional--

Display:
☑ Value above bar

?   Cancel   Compute!

A = 18   AB = 4   B = 6   O = 22

2. A phlebotomist draws the blood of a random sample of 50 patients and determines their blood types as shown.

O	A	A	O	O
B	O	B	A	O
AB	B	A	B	B
A	O	O	A	O
AB	O	A	B	A
A	A	A	O	O
O	A	O	B	A
O	B	A	A	O
O	O	O	O	O
O	A	O	A	O

(a) Construct a relative frequency distribution.

Blood Type	Frequency
A	.34
AB	.04
B	.16
O	.46

(Simplify your answers.)

(b) According to the data, which blood type is most common?

O

(c) According to the data, which blood type is least common?

AB

GRAPH – BAR PLOT- WITH DATA   Display value above bar   Relative Frequency

Bar Plot With Data

Select Column(s):
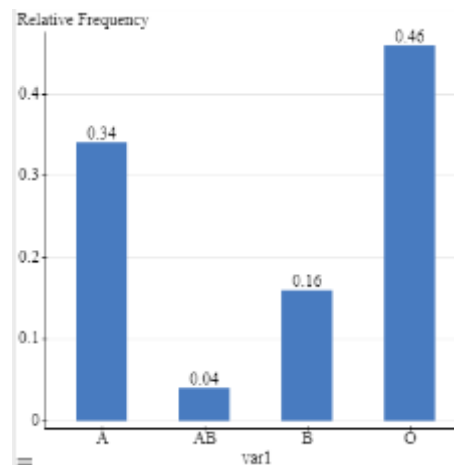var1 | var1

Where:
--optional--

Group by:
--optional--

Grouping options:
Split bars

Type:
Relative Frequency

Order by:
Value Ascending

"Other*" if percent less than:
--optional--

Display:
☑ Value above bar

(d) Use the results of the sample to conjecture the percentage of the population that has type O blood. Is this an example of descriptive or inferential statistics? Select the correct choice below and fill in the answer box to complete your choice.

✔A. 46 %; inferential

○B. ___ %; descriptive

(e) Contact a local hospital and ask them the percentage of the population that is blood type O. Why might the results differ?

○A. The results might differ because the results from the study are not likely to be similar to actual patients.

○B. The results might differ because certain hospitals only treat patients if they have blood type O.

✔C. The results might differ because there is always variability because the individuals in a survey may not exactly reflect the makeup of the population.

3. A frequency distribution lists the number of occurrences of each category of data, while a relative frequency distribution lists the proportion of occurrences of each category of data.

4. In a relative frequency distribution, what should the relative frequencies add up to?

Select the correct choice and, if necessary, fill in the answer box to complete your choice.

✅ A. The relative frequencies add up to 1 .

5. A phlebotomist draws the blood of a random sample of 50 patients and determines their blood types as shown.

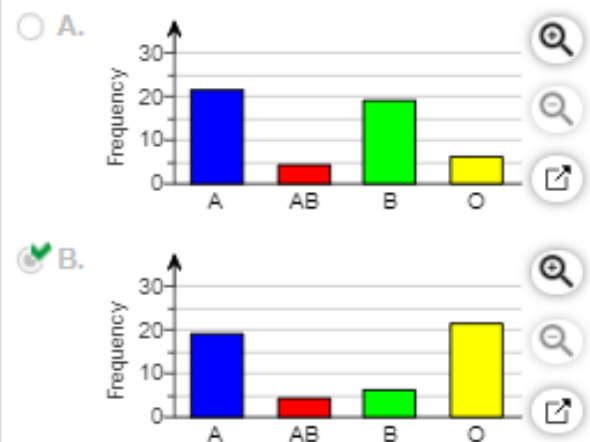| O	A	A	O	O
B	O	B	A	O
AB	AB	A	B	AB
A	O	A	A	O
AB	O	A	B	A
O	A	A	O	A
O	A	O	B	A
O	B	A	A	O
O	O	O	A	O
O	A	O	A	O

GRAPH – BAR PLOT- WITH DATA
Frequency
Display value above bar
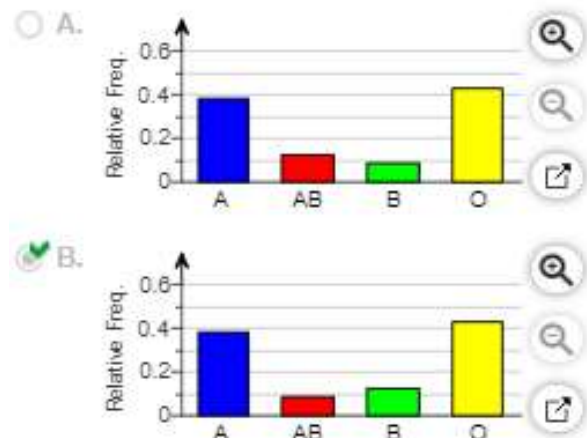
GRAPH – BAR PLOT- WITH DATA
Relative Frequency
Display value above bar

(a) Draw a frequency bar graph.

Choose the correct answer below.

○ A.

✅ B.

MATCH CHART WITH STATCRUNCH BAR CHART

(b) Draw a relative frequency bar graph.

Choose the correct answer below.

○ A.

✅ B.

FREQUENCY IS # OF ITEMS IN THE SET

RELATIVE FREQUENCY = $\dfrac{FREQUENCY}{SUM\ OF\ ALL\ ITEMS}$

6. A survey of adult men and women asked, "Which one of the following jobs would you most like to have?" The results of the survey are shown in the table.
(a) Construct a relative frequency distribution for men and women.
(b) Construct a side-by-side relative frequency bar graph.
(c) What are the apparent differences in gender as it pertains to this question?

Job	Men	Women
A	40	17
B	26	37
C	12	12
D	14	14
Not sure	7	20

(a) Complete the table below.

Job	Men	Women
A	.404	.17
B	.263	.37
C	.121	.12
D	.141	.14
Not sure	.071	.2

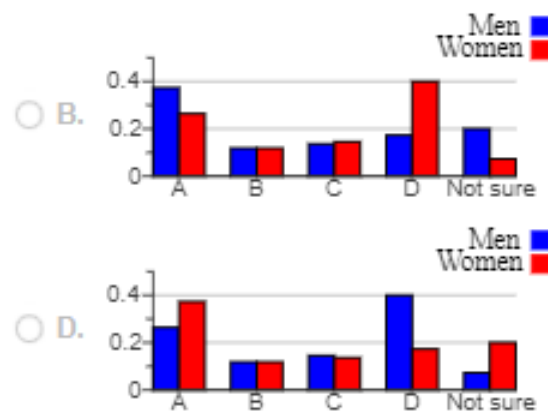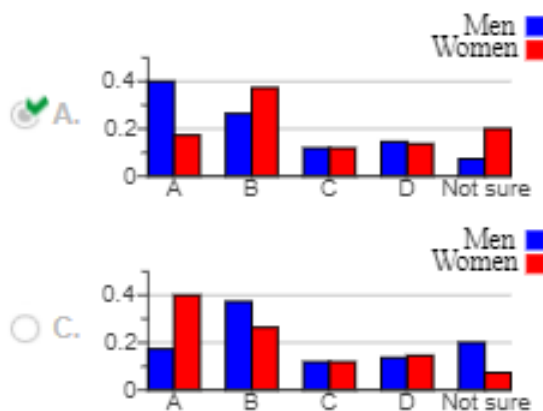(Round to three decimal places as needed.)

TOTAL MEN = 99   TOTAL WOMEN = 100

Men A $\dfrac{40}{99}$ = .404 do that for each Job Men and Women

Match chart with data

A.

B.

C.

D.

**(c)** Identify the responses that are clearly more frequent for men than for women. Select all that apply.

☑ A

Identify the responses that are clearly more frequent for women than for men. Select all that apply.

☑ B
☐ C
☐ D
☐ A
☑ Not sure

7. What is a bar graph? What is a Pareto chart?

☑ C. A bar graph is a horizontal or vertical representation of the frequency or relative frequency of the categories. The height of each rectangle represents the category's frequency or relative frequency.

☑ C. A Pareto chart is a bar graph whose bars are drawn in decreasing order of frequency or relative frequency.

8. The following Pareto chart shows the position played by the most valuable player (MVP) in a certain baseball league for the last 81 years. Use the chart to answer parts (a) through (d).

Most Valuable Player Award
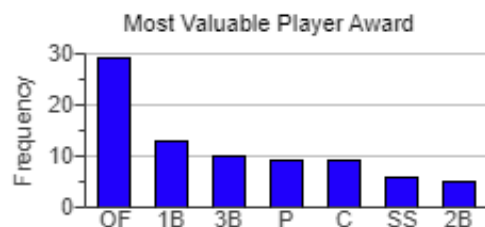
(a) Which position had the most MVPs?

The position with the most MVPs was outfield (OF).

(b) How many MVPs played catcher (C)?

9 MVPs played catcher.

**(c)** How many more MVPs played outfield (OF) than catcher?

20 more MVPs played outfield than catcher.
(Type a whole number.)

(d) There are three outfield positions (left field, center field, right field). Given this, how might the graph be misleading?

- ○ A. The graph is misleading because the bars are decreasing in height from left to right.
- ○ B. The positions or combinations of positions should be chosen so that all the bars are closer together in height.
- ✓ C. The chart seems to show that one position has many more MVPs because three positions are combined into one. They should be separated.

9.

Likelihood to Buy When Made in Home Country

More likely
Less likely
Neither
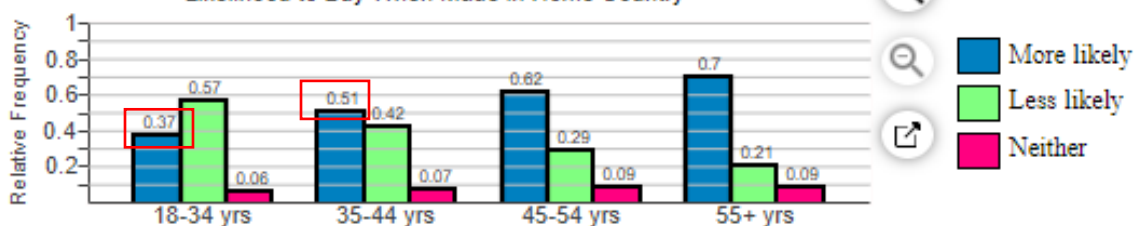
(a) What proportion of 18- to 34-year-old respondents are more likely to buy when made in their country? What proportion of 35- to 44-year-old respondents are more likely to buy when made in their country?

The proportion of 18- to 34-year-old respondents is .37 .
The proportion of 35- to 44-year-old respondents is .51 .

(b) What age group has the greatest proportion who are more likely to buy when made in their country?

- ○ A. 18-34 yrs
- ○ B. 35-44 yrs
- ✓ C. 55+ yrs

(c) Which age group has a majority of respondents who are less likely to buy when made in their country?

○ A. 35-44 yrs

○ B. 45-54 yrs

✔ C. 18-34 yrs

(d) What is the apparent association between age and likelihood to buy when made in their country?

○ A. As age decreases, likelihood to buy homegrown increases.

✔ B. As age increases, so does likelihood to buy homegrown.

○ C. There is no apparent association between age and likelihood to buy homegrown.
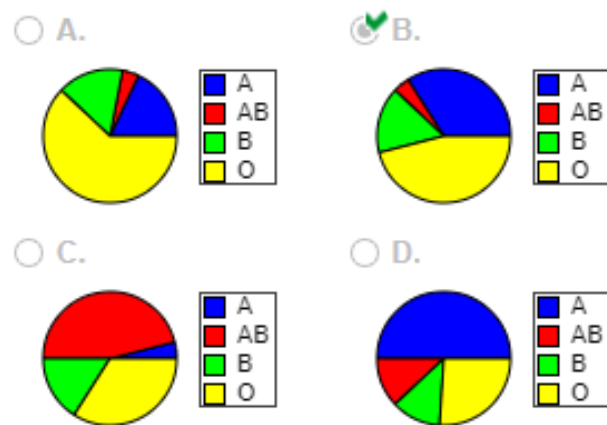
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10. A phlebotomist draws the blood of a random sample of 50 patients and determines their blood types as shown.

GRAPH – PIE CHART – WITH DATA

O	O	A	A	O
B	O	B	A	O
AB	B	A	B	B
A	O	O	A	O
AB	O	A	B	A
O	A	A	O	O
O	A	O	B	A
O	B	A	A	O
O	A	O	O	O
O	A	O	A	O

Draw a pie chart.

Choose the correct answer below.

○ A.

✔ B.

○ C.

○ D.

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11. A national survey asked people, "How often do you eat out for dinner, instead of at home?" The frequencies were as follows. Complete parts **(a)** through **(g)**.

Response	Frequency
Never	178
Rarely	398
Sometimes	920
Most of the time	428
Always	37

TOTAL 1961   Never $\dfrac{178}{1961} = .264$

(c) What percentage of respondents answered "Never" or "Rarely"?

29.4 %
(Round to one decimal place as needed.)

(a) Construct a relative frequency distribution of the data.

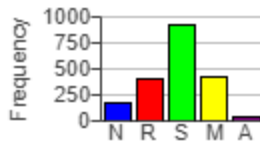| Response	Relative Frequency
Never	.091
Rarely	.203
Sometimes	.469
Most of the time	.218
Always	.019

(Round to three decimal places as needed.)

(b) What percentage of respondents answered "Always"?

1.9 %
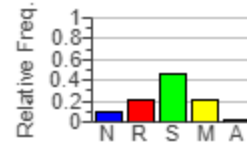(Round to one decimal place as needed.)

(d) Construct a frequency bar graph. Choose the correct answer below.

☑ **A.**

(e) Construct a relative frequency bar graph. Choose the correct answer below.

☑ **B.**

(f) Construct a pie chart. Choose the correct answer below.

☑ **A.**   ○ **B.**

(g) Suppose a person claims that, "1.9% of all people in the nation always eat out." Is this a descriptive or inferential statement?

☑ inferential

○ descriptive

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12. The data in the accompanying table represent the land area and highest elevation for each of seven states of a country. Complete parts **(a)** and **(b)**.

▦ Click the icon to view the data table.

(a) Would it make sense to draw a pie chart for land area?

○ No

☑ Yes

☑ **A.**

Land Area

■	State 1	20%
■	State 2	9%
■	State 3	30%
□	State 4	5%
□	State 5	7%
■	State 6	17%
□	State 7	12%

> STATCRUNCH
>
> GRAPH – PIE CHART – WITH SUMMARY
>
> Category – state
>
> Counts – land area

(b) Would it make sense to draw a pie chart for the highest elevation?

✗ Yes

☑ No

If it makes sense, draw a pie chart. Choose the correct answer below.

○ **A.**   ○ **B.**   ☑ **C.**
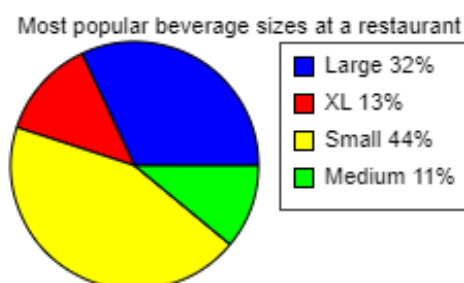
Highest Elevation   Highest Elevation

It does not make sense to draw a pie chart for highest elevation.

The correct answer is **No** because the highest elevation of each sector divided by the total highest elevation does not represent the relative frequency of the category.

13. The pie chart below depicts the beverage size customers choose while at a fast food restaurant. Complete parts **(a)** through **(c)**.

Most popular beverage sizes at a restaurant

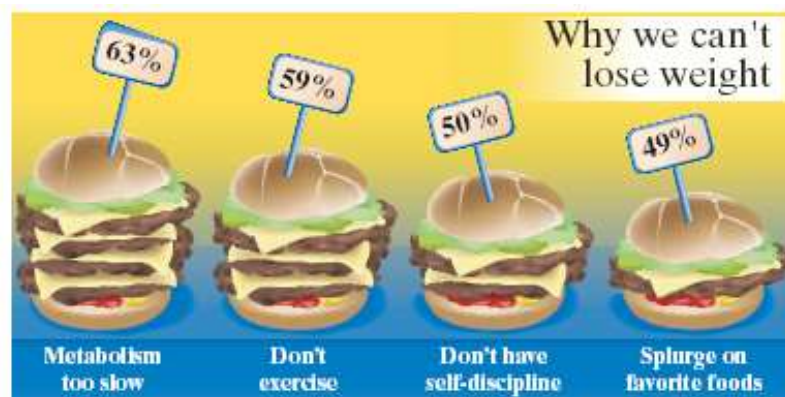|	
■	Large 32%
■	XL 13%
□	Small 44%
■	Medium 11%

(a) What is the most popular size? What percentage of customers choose this size?

- ○ A. Medium; 11%
- ✔ B. Small; 44%
- ○ C. XL; 13%
- ○ D. Large; 32%

(b) What is the least popular size? What percentage of customers choose this size?

- ○ A. Large; 32%
- ○ B. Small; 44%
- ✔ C. Medium; 11%
- ○ D. XL; 13%

(c) What percent of customers choose a large-sized beverage?

- ○ A. 19%
- ○ B. 13%
- ✔ C. 32%
- ○ D. 61%

14. Consider the information in the "Why we can't lose weight" chart shown to the right, which is in the magazine style of graph. Could the information provided be organized into a pie chart? Why or why not?

Why we can't lose weight

63% Metabolism too slow
59% Don't exercise
50% Don't have self-discipline
49% Splurge on favorite foods

- ○ A. No. There are more than 3 categories of data.
- ○ B. No. The values in the table are not decimals.
- ✔ C. No. The percentages add up to more than 100%.
- ○ D. Yes. The information could be organized into a pie chart.