2.2 Bar Graphs, Circle Graphs, and Time-Series Graphs with work

2.1 HW answers

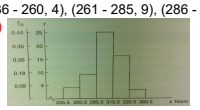
1. class limits are possible data values and specify the span of data values that fall within the class. Class boundaries are not possible data values; they are values halfway between the upper class limit and lower class limit of the next.

3. The classes overlap so that some data values, such as 20, fall within two classes.

5. Class width = 9; class limits: 20 - 28, 29 - 37, 38 - 46, 47 - 55, 56 - 64, 65 - 73, 74 - 82

7. a) ANSWERS VARY. Skewed right, if you hope most of the waiting times are low, with only a few high times. b) ANSWERS VARY. A bimodal distribution might reflect the fact that when there are lots of customers, most of the waiting times are longer, especially since the lines are likely to be long. On the other hand, when there are fewer customers, the lines are short or almost nonexistent, and most of the waiting times are briefer.

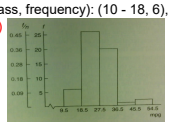
15. a) class width = 25 b) (class, frequency): (236 - 260, 4), (261 - 285, 9), (286 - 310, 25), (311 - 335, 16), (336 - 360, 3) c & d)



e) approximately mound-shaped symmetrical

f) OMIT

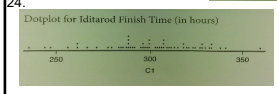
19. a) class width = 9 b) (class, frequency): (10 - 18, 6), (19 - 27, 26), (28 - 36, 20), (37 - 45, 1), (46 - 54, 2) c & d)



e) skewed slightly right

f) OMIT

24.



Sep 19-10:37 AM

2.2 Bar Graphs, Circle Graphs, and Time-Series Graphs

Essential Question:

How do we effectively communicate data using graphs?

Focus Points:

- Determine types of graphs appropriate for specific data.
- Construct bar graphs, Pareto charts, circle graphs, and time-series graphs
- Interpret information displayed in graphs.

Sep 19-8:13 AM

Histograms only display quantitative data. These new graphs can display qualitative data as well.

Sep 19-8:37 AM

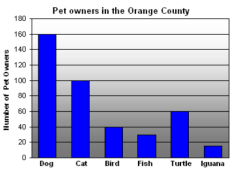
BAR GRAPH

Features:

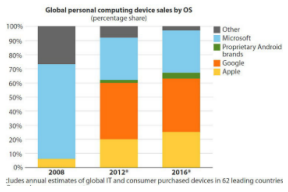
- Bars can be vertical or horizontal.
- Bars are of uniform width and uniformly spaced (not touching like histograms.)
- The lengths of the bars represent values of the variable being displayed, the frequency/percentage of occurrence. The same measurement scale is used for the length of each bar.
- The graph is well labeled: title, each bar is labeled, and vertical scale or actual value for the length of each bar.

Sep 19-8:38 AM

Categorical bar graph



Segmented Bar Graph



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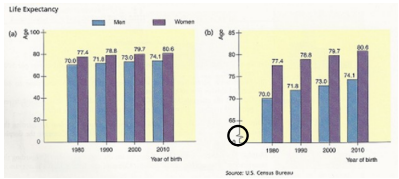
Changing Scale of Graph

Use a squiggle/graph break ⌇ on the changed axis to show the graph reader the numbers are changed.



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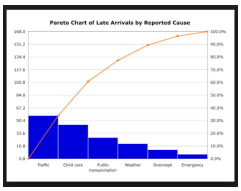
2.2 Bar Graphs, Circle Graphs, and Time-Series Graphs with work

A Pareto chart is a bar graph in which the bar height represents frequency of an event. Bars are arranged from left to right according to decreasing height.

Skewed Right



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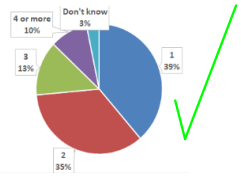
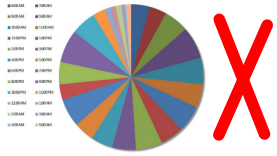
Circle Graph or Pie Chart

wedges of a circle visually display proportional parts of the total population that share a common characteristic. Typically qualitative.





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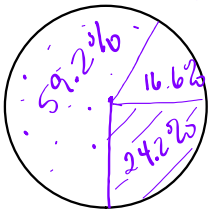
Example 1: Circle Graph

How long do we spend talking on the phone after hours (at home after 5pm)? The results from a recent survey of 500 people (as reported in *USA Today*) are shown below. Fill in blanks and make a circle graph to display these data.

Time	Number	Fractional Part	Percentage	Number of Degrees
Less than 0.5 hr	296	$\frac{296}{500}$	59.2%	59.2%(360°) ≈ 213°
0.5 hr - 1 hr	83	$\frac{83}{500}$	16.6%	16.6%(360°) ≈ 60°
More than 1 hr	121	$\frac{121}{500}$	24.2%	24.2%(360°) ≈ 87.12°
TOTAL	500		100%	

Draw and label the circle graph appropriately.

∴ < .5hr
= > 1hr
□ .5–1hr



Time spent on phone after 5p.m.

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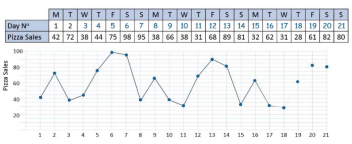
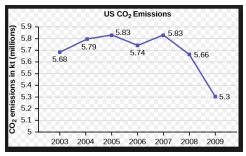
Time-Series Graph

data are plotted in order of occurrence at regular intervals over a period of time.





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Time-series Data

measurements of the same variable for the same subject taken at regular intervals over a period of time.

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How to Decide Which Type of Graph to Use:

Bar Graphs: useful for all types of data. For qualitative, frequency/percentage of occurrence can be displayed. For quantitative, the measurement itself can be displayed. Watch the measurement scale for consistency or use the squiggle.

Pareto charts: identify the frequency of events or categories in decreasing order of frequency of occurrence.

Circle Graphs: display how a *total* is dispersed into several categories. Appropriate for qualitative data or any percentage data. Most effective when the number of categories/wedges is 10 or less.

Time-series Graph: how data changes over time. It is best if the units of time are consistent. ie: daily data collection or weekly

Sep 19-10:22 AM

2.2 Bar Graphs, Circle Graphs, and Time-Series Graphs with work

For ANY Graph:

- title
- label the axes with numbers and words
- identify units of measure
- Be sure a random person would be able to read and know your graph based on information given

Sep 19-10:27 AM

HW: pg. 65: 1, 9, 13, 15

Sep 19-10:32 AM