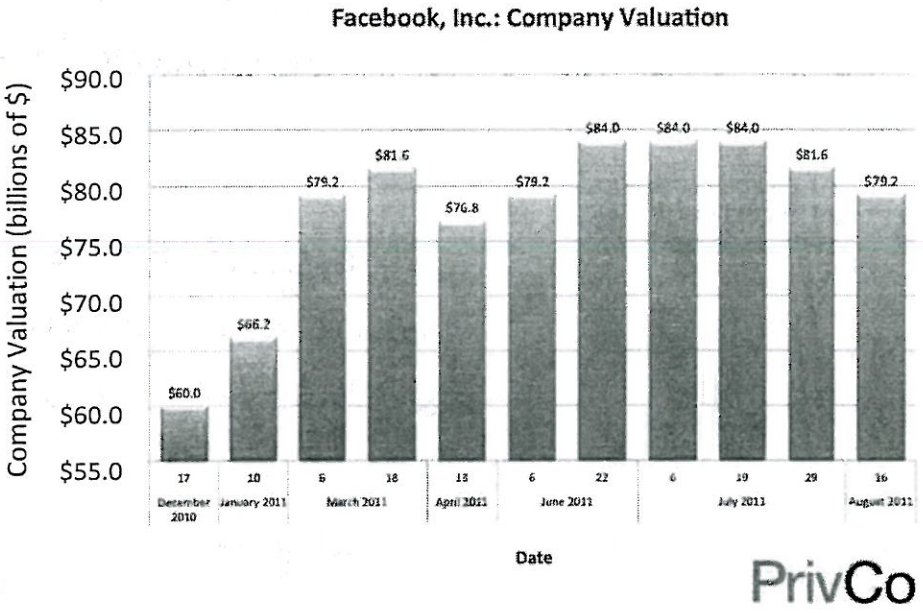
MAT156: Statistics
Section 2-4B: Graphs that Enlighten & Deceive

Name: _____
Date: _____ Period: _____

What's wrong with these graphs?

Each of the graphs included below has at least one "issue" and sometimes multiple "issues" that lead to it being deceptive to a reader who isn't critically analyzing the information he or she is consuming. Your task is to identify at least one, and more if possible, problem with each visual display of data. Pay attention to the context of each data visualization. Some of them are interesting. ☺

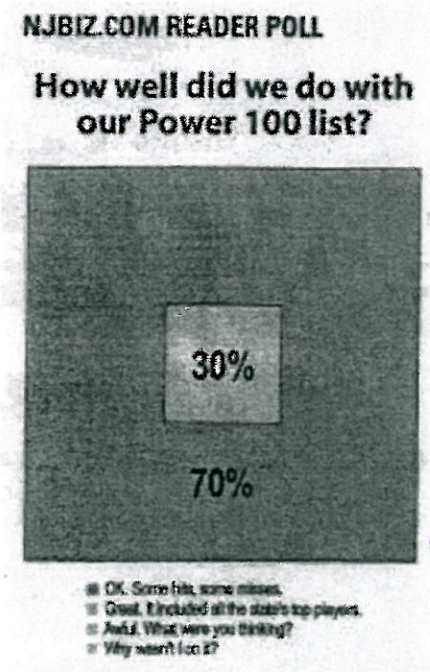
1.



Issue(s):

- y-axis does not start at zero so difference between dates is exaggerated
- times along x-axis aren't evenly spaced

2.



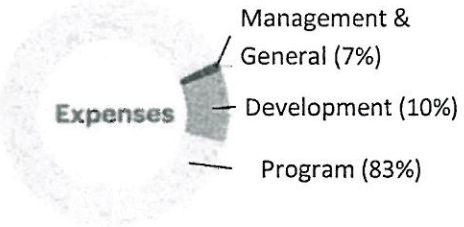
Issue(s):

70% area is much more than $2\frac{1}{3}$ times the 30% area

↓

violation of "area principle"

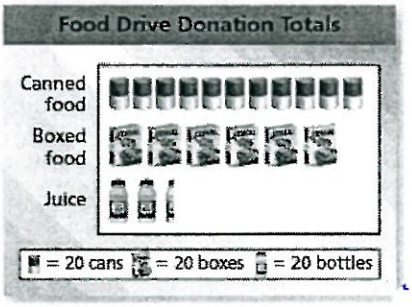
3. Context: From a charitable organization's website



Issue(s): 7% and 10% sections are not proportional

pictographs

4.

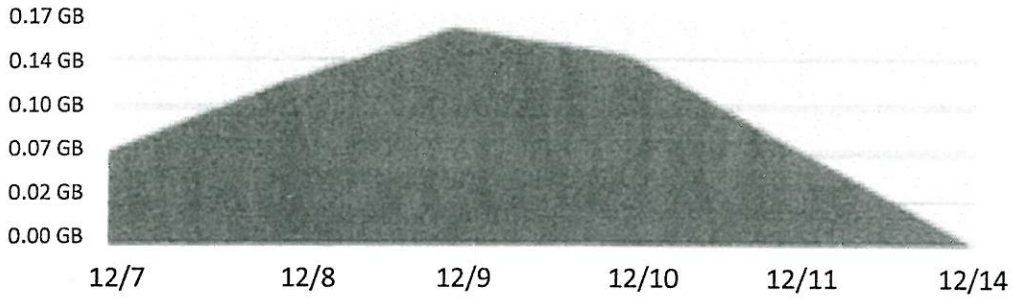


Issue(s):

Each can is not the same size, so boxed and cans look close to equal when they aren't.

5. Context: Data Usage from a mobile hotspot. Also, the hotspot was not used at all on 12/12 and 12/13.

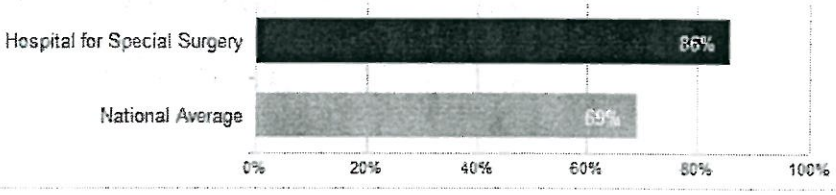
time-series



Issue(s): Skipping over the days where none is used gives an inaccurate trend interpretation.

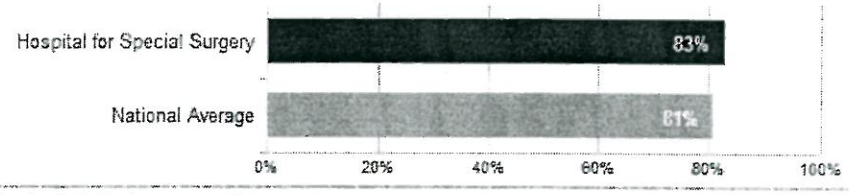
bar graph (relative frequency)

6. **1. Patients gave the hospital a rating of 9 or 10 (high).**

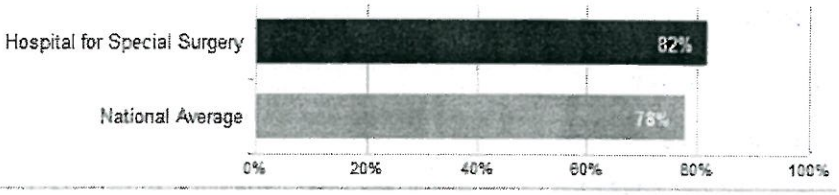


Issue(s): unequal scales make certain quantities look the same (83% and 67%)

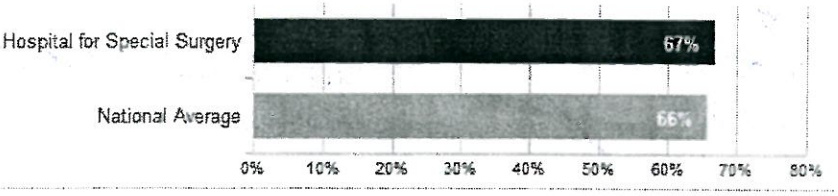
2. Patients felt their doctors "always" communicated well.



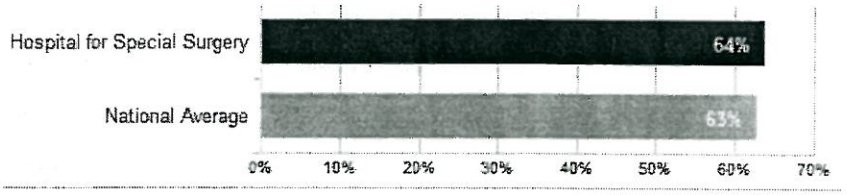
3. Patients felt their nurses "always" communicated well.



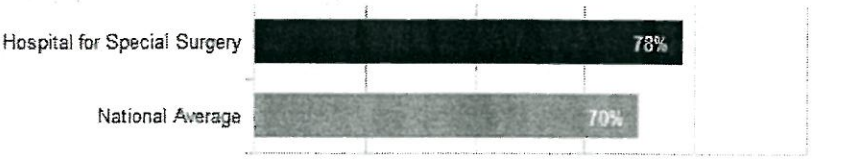
4. Patients "always" received help as soon as they wanted.



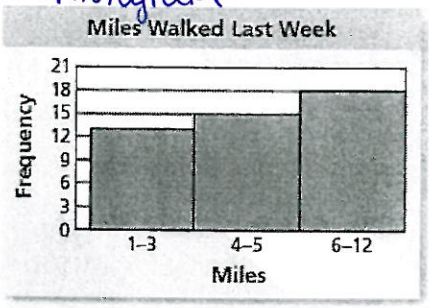
5. Patients felt the hospital staff "always" explained medicines.



6. Patients felt their pain was "always" well controlled.

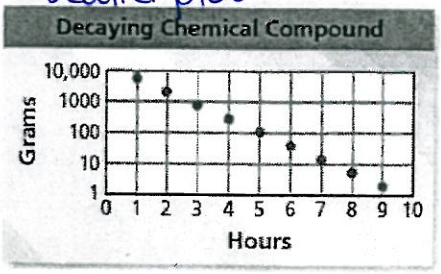


7. histogram



Issue(s): class widths are not equal and class boundaries weren't used to label

8. scatterplot



Issue(s): vertical scale increases by powers of 10, so what looks linear is really exponential