Technology Integrated Mathematics
Class Notes
Statistics: Reading Graphs (Section 12.1)

Graphs allow us to see a lot of information at a glance and so are used quite a lot. Reading graphs is a useful skill to develop. We will focus on three types here; let's start with bar graphs.

Definition: Bar graph: A **bar graph** is used to display and compare the sizes of different but related quantities. The bars can be drawn either vertically or horizontally. Each bar should be of equal width; the height (or length) will indicate the measure of the quantity.
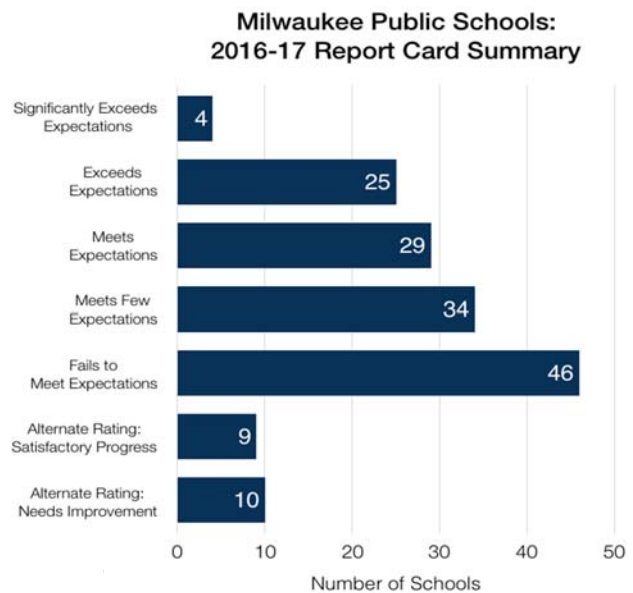
You should look for a title and axes labels. Be careful to note the scale of the axes and the units.

expl 1: Consider the bar graph below to answer the following questions.

a.) What does this graph display?

Milwaukee Public Schools: 2016-17 Report Card Summary

Category	Number of Schools
Significantly Exceeds Expectations	4
Exceeds Expectations	25
Meets Expectations	29
Meets Few Expectations	34
Fails to Meet Expectations	46
Alternate Rating: Satisfactory Progress	9
Alternate Rating: Needs Improvement	10

b.) How many schools "meet expectations"?

c.) How many schools score at "meets expectations" or above?

(Source: http://www.goethes-farbenlehre.com/bar-graph-vs-column-graph.html)
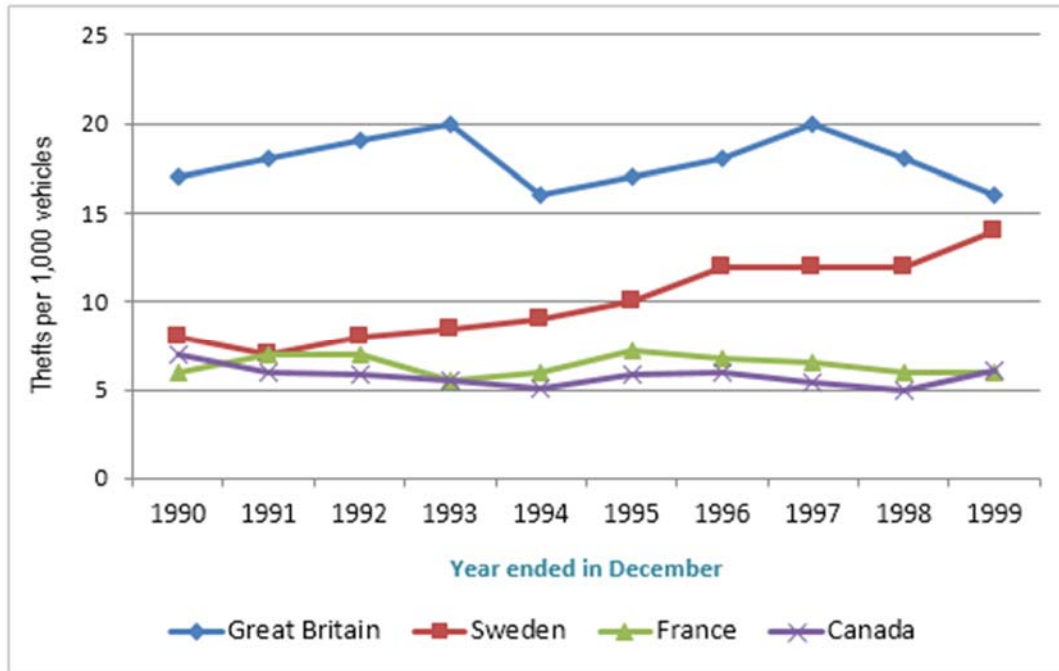
d.) Of the 157 schools represented, what percentage "fails to meet expectations"? Round to the nearest tenth of a percent.

e.) How many more schools "fail to meet expectations" as compared to those schools that "meet expectations"?

Definition: Line graphs: A **line graph**, or **broken-line** or **time-series graph**, is used to show how a quantity changes over time. Time will be displayed on the horizontal axis with the quantity on the vertical axis.

Often, the vertical scale does *not* start at zero. Be careful of the scale when reading these graphs.

expl 2: Below we see a line graph detailing the car theft rates in a few countries over time.


(source: https://www.ielts-mentor.com/writing-sample/academic-writing-task-1/3025-thefts-per-thousand-vehicles-in-four-countries)

a.) Estimate the lowest rate seen in Great Britain. Round to the nearest whole number. Use the units "thefts per 1,000 vehicles". What year(s) did Great Britain enjoy this "low" rate?

b.) Estimate the vehicle thefts per 1,000 vehicles for 1995 for Sweden.

expl 3: To the right is a graph that shows the fuel economy (miles per gallon) when a car is driven at certain speeds. Answer the following questions. Include units.

a.) Estimate the fuel economy for the speeds of 55 mph and 75 mph. Round to the nearest quarter unit.
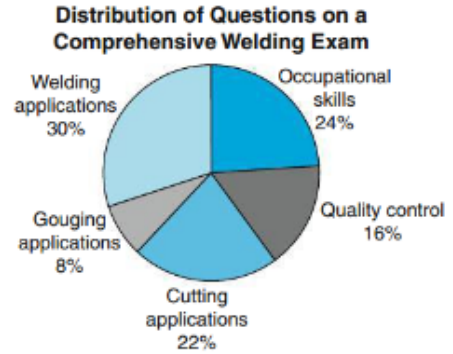
Fuel Economy by Speed
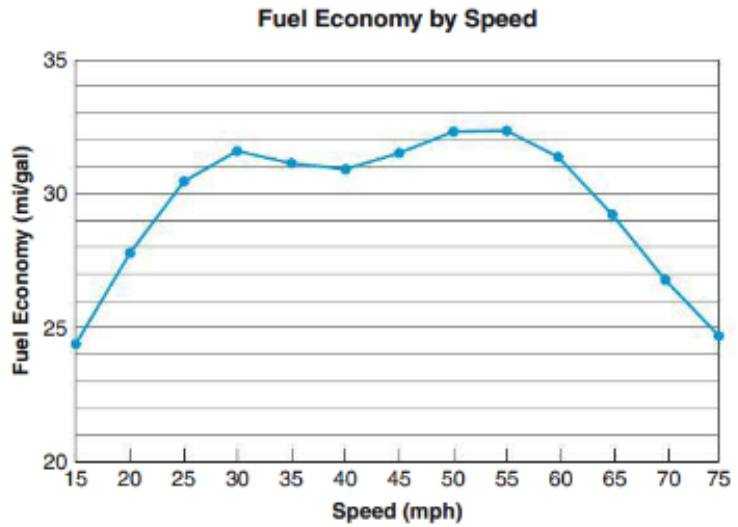
b.) Calculate the percent *decrease* in fuel economy when you go 75 mph as opposed to 55 mph.

Recall, percent change is found by dividing the amount of change by the original amount.

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Definition: Circle graph: A **circle graph** or **pie chart** is used to display the percentages of a whole that are represented by its separate parts.

expl 4: Examine the pie chart given here.

a.) If there are 50 questions on this exam, how many would you expect to cover quality control?

Distribution of Questions on a Comprehensive Welding Exam

Welding applications 30%

Occupational skills 24%

Gouging applications 8%

Quality control 16%

Cutting applications 22%

b.) Assume there are 33 questions that cover cutting applications. How many questions would cover occupational skills?

Set up a proportion.

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