

# Data Interpretations - Tables and Graphs

There are three main subtopics the PSAT covers in Data Interpretations --

1. Tables
2. Graphs
3. Pie Charts

There are many types of graphs, displays, tables, etc. from which data can be summed up. In the following four examples we will look at two tables, one type of graph, and a pie chart. That being said, keep in mind there are an infinite number of these graphical displays out there. These are merely four examples that live in the much bigger world of data interpretation.

Ex In recent years there has been considerable discussion about the appropriateness of the body shapes and proportions of the Ken and Barbie dolls. Researchers investigating the dolls' body shapes scaled Ken and Barbie up to a common height of 170.18 cm (5' 7") and compared them to body measurements of active adults. Common measures of body shape are the chest (bust), waist, and hip circumferences. These measurements for Ken and Barbie and their reference groups are presented in the table below:

**Doll and Human Reference Group Measurements (cm)**

	Ken			Barbie		
	Chest	Waist	Hips	Chest	Waist	Hips
Doll	75.0	56.5	72.0	82.3	40.7	72.7
Human	91.2	80.9	93.7	90.3	69.8	97.9

For the following questions, suppose that the researchers' scaled up dolls suddenly found themselves in the human world of actual men and women.

- (a) Which of Ken's measures appears to be the most different from his reference group?

Ken's Chest Difference :  $91.2 - 75 = 16.2$  cm

Ken's Waist Difference :  $80.9 - 56.5 = 24.4$  cm

Ken's Hip Difference :  $93.7 - 72 = 21.7$  cm

Ken's waist is off by the greatest number, off by 24.4 cm

(b) Which of Barbie's measures appears to be the most different from her reference group?

Barbie's Chest Difference :  $90.3 - 82.3 = 8$  cm

Barbie's Waist Difference :  $69.8 - 40.7 = 29.1$  cm

Barbie's Hip Difference :  $97.9 - 72.7 = 25.2$  cm

Barbie's waist is off by the greatest number, off by 29.1 cm

(c) Which is the most distorted measurement overall?

While both measurements have their greatest error in the waist, Barbie's waist is off by the greatest number, off by 29.1 cm.

Some tables may ask you to calculate probabilities as well, as in this next example.

Ex In November 2002, Janet Napolitano, a Democrat, was elected Governor of Arizona, defeating Republican Matt Salmon and Independent Richard Mahoney. This was a somewhat surprising outcome, since there are more registered Republicans than Democrats in the state. The table below presents the results of a sample of voters in the election. The number who voted for each of the candidates is presented in the rows, and the party affiliation of the voters is presented in the columns. Use the information in the table to answer the questions below.

Voters who are registered as...				
Voted for...	D	R	I	Totals
Napolitano (D)	184	42	56	282
Salmon (R)	26	205	45	276
Mahoney (I)	6	5	31	42
Totals	216	252	132	600

a) What is the probability that a randomly chosen voter voted for Napolitano?

$$P(\text{Napolitano}) = \frac{282}{600}$$

b) What is the probability that a randomly chosen voter is a registered Democrat?

$$P(\text{Democrat}) = \frac{216}{600}$$

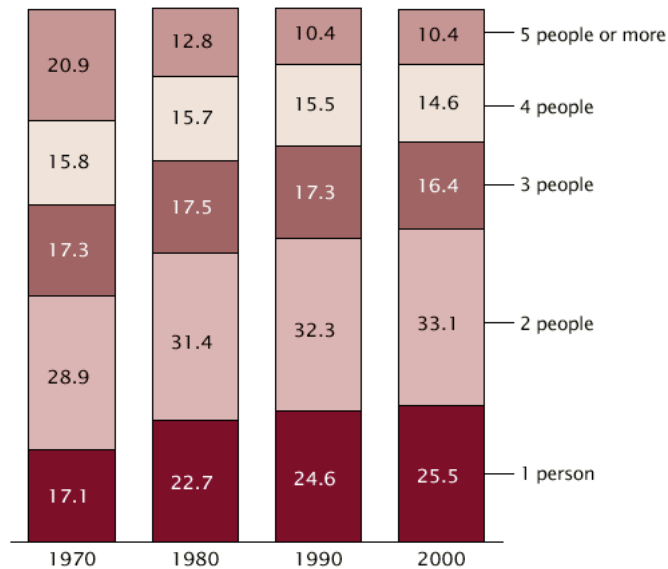
c) What is the probability that a randomly chosen voter cast a vote for Napolitano, given that the selected voter is a Democrat?

$$P(\text{Napolitano} | \text{Democrat}) = \frac{184}{216}$$

As part of the United States Census, data is also collected on the number of persons in each household. The census data for four decades is summarized below.

### Households by Size: Selected Years, 1970 to 2000

(Percent distribution)



Source: U.S. Census Bureau, Current Population Survey, March Supplements: 1970 to 2000.

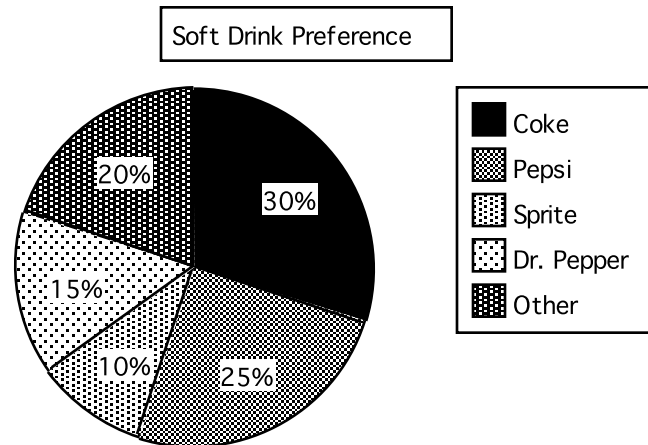
(a) In a few sentences describe how the proportion of households with 5 people or more has changed from 1970 to 2000.

The proportion of households with 5 people or more has been cut almost exactly in half from 1970 to 2000. Although, of note, is the fact that there was no change from 1990 to 2000.

(b) What size of household appears to have increased the most from 1970 to 2000?

Households of size 1 have increased the most from 1970 to 2000.

Ex The pie chart below summarizes the results of a survey of 300 randomly selected students at a particular high school. The investigators asked about soft drink preferences at a local high school.



(a) How many out of the 300 students indicated a preference for Dr. Pepper?

$$300 \cdot .15 = 45$$

45 students

(b) Write a few sentences summarizing the soft drink preference for this sample of students.

It looks as though Cola, whether Pepsi or Coke, is the most preferred soft drink carrying a 55% majority. Dr. Pepper and Sprite are significantly lower in preference.