Data Interpretation Problems

**Data Interpretation Problems**

These are designed to test your understanding of fractions and percents and your attention to detail. These tend to be the most time consuming questions to answer. But you can often approximate the answer (instead of calculating it) and be able to identify the answer from the list of choices. Three of the 20 questions in each quantitative section of the GRE are data interpretation questions. They are three consecutive questions that refer to the same set of graphs or charts.

Here’s a systematic approach to these types of problems:

- **Analyze the tables and graphs** (This takes time – expect to spend 15 to 30 seconds on this)
  - Titles – Read the titles for the graphs to make sure you can get to the correct one quickly (the tables and charts often come in pairs).
  - Scale – Check the units of measurement being used on the graphs (missing the units can drastically change your answer).
  - Notes – Read any notes that are included – this information is usually only given if it is critical to getting the correct answers.
  - Key – If there are multiple bars/lines on the graph, make sure that you understand the key in order to match up the correct quantity you are looking up.

**Be strategic in your approach**

Questions tend to become more complex as you move through a set. For example, if there were a pair of graphs, the first question usually only refers to one of the graphs (make sure you go to the correct one!). You can expect a later question to involve getting data from both graphs. If you have multiple answers to choose from, using approximation (instead of calculation) to identify the answer from the list will save time.
Sales and Earnings of
XYZ Corporation 1991 - 1998

Before you read the first question take 15 – 30 seconds to study the graphs. Here is what you should be observing:
The bar graph on the left is for SALES (and it is in Billions $)
The bar graph on the right is for EARNINGS (and it is in Millions $)
The pie chart is for only one year, 1998, and it shows percentage of SALES by category.

1. What is the average (arithmetic mean) in billions of dollars of the sales of XYZ Corporation for the period 1991 – 1998?
A) 5.5   B) 6.0   C) 7.0   D) 8.0   E) 8.5
Solution: Choice (C)

First, make sure that you go to the correct chart, which is the bar graph of the left. Note that the bar graph is in Billions $, and the question is asking for the answer to be in Billions $.

Here are two different ways you can get your answer:

Method #1: From the bar graph read of the sales for each year (3, 6, 8, 7, 5, 9, 8, 10), and them up and divide by the number of data values (8):

\[
\frac{\text{Sum of data values}}{\text{Number of data values}} = \frac{56}{8} = 7
\]

Method #2: Looking at the bar graph ask yourself “Where could I draw a horizontal line across this graph so that there would be the same amount of “gray area” above the line as “white area” below the line?

The portions of the bars above the line (the “grey area”) for 1993 and 1996 – 1998 are just about exactly the same size as the “white area” below the line for 1991, 1992, 1995

This “balance point” is the arithmetic mean = 7.
2. For which year was the percentage increase in earnings from the previous year the greatest?

Solution: Choice (C)
First, note that you will be using the bar graph on the right for Earnings. You need to be careful on this one and note that they are NOT asking for the year in which the $ increase in earnings from the previous year was the greatest. They are asking for the year in which the PERCENT increase in earnings was the greatest. So even though the greatest $ increase in earnings happened from 1991 to 1992, this isn’t necessarily the largest PERCENT increase.
Looking at our graph, the only possible answers are the years where there was a significant increase in earnings: 1992, 1994, 1995 (we can “throw out” 1996 since it was such a small increase).

In 1993 to 1994 the earnings went from 200 to 400. It doubled, which is an increase of 100%. Did any of the other years do THAT well? In 1991 to 1992 it went from 500 to 900. You don’t need to calculate the percentage increase to know that it did not double, so its percentage increase is LESS than for 1993 to 1994. (But if you did want to calculate it for 1991 to 1992: \( \frac{900-500}{500} = 80\% \) increase).

Let’s check for 1994 to 1995: it went from 400 to 700, which is less than doubling (If you want to calculate it for 1994 to 1995: \( \frac{700-400}{400} = 75\% \)).

So even though the largest $ increase was from 1991 to 1992, its PERCENT increase was only 80%. The largest PERCENT increase was from 1993 to 1994 of 100%, even though the $ increase was only $400 - $200 = $200 million.
3. Which of the following statements can be deduced from the data in the given charts and circle graph?

Indicate all such statements.


B) Earnings for the year in which earnings were greatest were more than sales for the year in which sales were lowest.

C) If in 1998, the sales of major appliances had been 10% less, and the sales of computers had been 10% greater, the sales of major appliances would have been less than the sales of computers.
Solution: Only choice (A) is true. The strategy to this problem is to work with each statement individually to determine if it is true or not.

Let’s look at statement (A). We need to refer to both the circle graph and the Sales bar graph:

In 1998 the Sales was 10 Billion (get this from the bar graph), and 40% of this was for Major Appliances (get this from the circle graph).

40% of $10 Billion = (0.40)(10) Billion = $4 Billion

Now compare this with the Sales for 1991: $3 Billion

So the Sales of Major Appliances in 1998 ($4 Billion) IS more than the total Sales in 1991 ($3 Billion).

So statement (A) is true.

Now let’s move on to statement (B):

B) Earnings for the year in which earning were greatest were more than sales for the year in which sales were lowest.

We need to refer to the two bar graphs. Note carefully that one is in BILLIONS and the other is in MILLIONS:
The year in which Earnings were the greatest was 1992 (get this from the bar graph on the right). The Earnings were $900 MILLION in 1992.
The year in which Sales were the lowest was 1991 (get this from the bar graph on the left). The Sales were $3 BILLION in 1991.
The Earnings of $900 MILLION (which is LESS THAN 1 BILLION) is LESS THAN the Sales of $3 BILLION.
So statement (B) is false.

Now let’s look at statement (C):

C) If in 1998, the sales of major appliances had been 10% less, and the sales of computers had been 10% greater, the sales of major appliances would have been less than the sales of computers.

We need to refer to both the circle graph and the Sales bar graph:
Here’s the REAL question:
Is 90% of $4 Billion LESS THAN 110% of $2.5 Billion?

In 1998 the total Sales was $10 Billion, and 40% of this was for major appliances.  
40% of $10 Billion = (0.40)(10) Billion = $4 Billion in sales for major appliances.  
If this had been 10% less:  (0.90)($4 Billion) = $3.6 Billion for major appliances.  
In 1998 the total Sales was $10 Billion, and 25% of this was for computers.  
25% of $10 Billion = (0.25)(10) Billion = $2.5 Billion in sales for computers.  
If this had been 10% more:  (1.1)($2.5 Billion) = $2.75 Billion for computers.  
Sales for major appliances would be $3.6 Billion, which is MORE than sales for computers which would be $2.75 Billion.  
So statement (C) is false.
4. What was the ratio of earnings to sales in 1993?

\[
\frac{200,000,000}{8,000,000,000} = \frac{200}{80} = \frac{1}{40}
\]

You will be referring to the two bar graphs, but take careful note that Earnings is in MILLIONS and Sales is in BILLIONS:

Earnings in 1993 \(=\) 200 Million = \(\frac{200,000,000}{8,000,000,000} = \frac{2}{80} = \frac{1}{40}\)