

Sample Problems on Data Abuse

Problem 1:

Advertisement A

Save 50% on all regular price clothing!!!

Take 20% off of all regular price clothing!!!

Then take 30% of the newly reduced price for a total savings of 50%!!!

Advertisement B

Save 50% on all regular price clothing!!!

Take 1/2 off of the regular price!!!

Which of the advertisements above accurately describes a sale in which the customer saves 50% on regular price clothing? How is the other advertisement misleading? If a sweater costs \$50 before the sale, how much will it cost at Store A? How much will it cost at Store B?

Problem 2:

You have a coupon for 10% off of any shirt purchase at Shirts Galore. In addition, Shirts Galore is having a sale that allows you to take an additional 20% off of all purchases.

Shirts, Inc., however, is having a sale that allows you to take 30% off of any shirt purchase.

You want to buy a shirt that is \$10 at regular price at both stores. Where should you go to buy the shirt? How much will it cost at each store?

Problem 3:

Read the following statement and explain the statistical error.

One hundred birds increase their population by 50% in one year. In the next two years, however, there is a problem in the food chain and many birds die. By the end of the third year, the bird population is 50% less than it was two years earlier. Therefore, the bird population remains the same over the three year period, and there are 100 birds at the end of the three years.

Problem 4:

Sunglass Center and Sunglass World both sold sunglasses for \$30 per pair in 1996. In 1997, Sunglass center increased the price of their sunglasses by 10%. However, they found that this price increase did not increase their profit, so they decreased the new price of their sunglasses by 10% in 1998. In 1997, Sunglass World decreased the price of their sunglasses by 10% to compete with Sunglass Center. However, they found that they were not making a profit with this decreased price, so they increased the new price of their sunglasses by 10% in 1998. Your best friend claims that both stores are selling sunglasses for the same price in 1998 as they were in 1996. Is this true? If not, how much was each store selling sunglasses for in 1998?

Problem 5:

A poll taken at a college says that 38% of students like pizza the best, 32% like hamburgers the best, and 30% like spaghetti the best. You say that most of the students at the college like pizza the best. Your friend argues that you are wrong. What does he say and why is he right?

Problem 6:

What is wrong with the following advertisement for furniture? What would actually happen if this advertisement were true?

Save 500%-900% on all furniture sales today and tomorrow only!!!

Problem 7:

A store is having a sale that allows a customer to choose one of two options: a) take 10% off of an item's regular price, then take 10% off of the reduced price, or b) take a one-time only discount of 20% off of an item's regular price?

Which option should the customer choose? Does the choice depend upon the original price of the item?

Problem 8:

A principal says that most students in her school would prefer to go to school for one extra day each year. You conduct a survey and find that 200 students would prefer the extra day. Under what circumstances would you agree with the principal? Under what circumstances would you argue that most students would prefer not to go the extra day?

Answers:

Answer 1: The sweater will cost \$28 at Store A and \$25 at Store B.

Answer 2: At Shirts Galore, the shirt will cost \$7.20, and at Shirts, Inc., the shirt will cost \$7.00. Thus, you should go to Shirts, Inc. to buy your new shirt.

Answer 3: At the end of the first year, the bird population has increased to 150 birds. In the next two years, the bird population is reduced to 75 birds. Thus, the bird population is not the same as it was three years earlier.

Answer 4: In 1998, sunglasses cost \$29.70 at Sunglass Center and at Sunglass World.

Answer 5: Most of the students at the college do not like pizza the best (62% have a favorite food other than pizza).

Answer 6: An item cannot be discounted more than all of its regular price--that is, 100% of its regular price. If a customer were to actually save 500% on an item, the furniture store would pay the customer four times the original cost of the item.

Answer 7: The customer should always choose the one-time discount of 20%. Option A equates to a one-time discount of 19% off of regular price.

Answer 8: If your student population is between 200 and 399 students, then the principal is right. If the student population is above 400 students, then the principal is wrong. If the student population is exactly 400 students, then the opinion of the majority cannot be determined.