Margin of Error

Battery Life (In Hours)			
63.2	84.6	78.4	85.8
62.1	81.8	63.6	64.2
79.4	75.2	54.1	73.4
66.3	74.5	71.6	60.1
61.2	74.5	72.4	81.3
61.4	83.6	75.6	74.1
68.3	82.2	59.3	47.6
86.2	64.3	72.7	71.8
71.4	63.6	59.6	68.1

1. A consumer research group tested the battery life of 36 randomly chosen batteries to establish the likely battery life for the population of same type of battery. Find the 95% confident interval for the population mean.

2. A sample of size n = 50 is drawn from a population whose standard deviation is 26.
   a) Find the margin of error for a 95% confidence interval for the population mean.

   b) If the sample size were n = 40, would the margin of error be larger or smaller? How do you know?

3. A population has a standard deviation of 17.3.
   a) How large must a sample be drawn so that a 95% confidence interval for the population mean will have a margin of error that is no more than 1.4?

   b) What must the sample size be in order to have a margin of error that is no more than 0.7?

4. Of a sample of 1000 adults, 400 said they believe in love at first sight.
   a) What is the proportion of the sample population that believes in love at first sight?

   b) Find the margin of error that corresponds to a 95% confidence level.

5. A Pew Research Center poll of 1501 randomly selected U.S. adults showed that 70% of the respondents believe in global warming. The sample results are $n = 1501$ and $p = .70$
   a) Find the margin of error that corresponds to a 95% confidence level

   b) Find the 95% confidence interval of the actual percentage of the U.S. adult population that believes in global warming

   c) Assuming you are a newspaper reporter, write a brief statement that accurately describes the results and includes all of the relevant information.

6. In 2001, a Gallup poll surveyed 1016 households in the U.S about their pets. Of those surveyed, 599 said they had at least one dog or cat as a pet.
   a) What is the proportion of the sample population that believes in love at first sight?

   b) Find the margin of error that corresponds to a 95% confidence level.

7. A study of 420,095 Danish cell phone users found that 135 of them developed cancer of the brain or nervous system. Prior to this study of cell phone use, the rate of such cancer was found to be 0.0340% for those not using cell phones. The data are from the Journal of the National Cancer Institute.

   a) Use the sample data to construct a 95% confidence interval of the percentage of cell phone users who develop cancer of the brain or nervous system.

   b) Do cell phone users appear to have a rate of cancer of the brain or nervous system that is different from the rate of such cancers among those not using cell phones? Why or why not?