Math 263
Quiz 4 **Name**_____

Please show your work.

Acidity is measured by pH, which varies from 0 (very acidic) to 14 (very basic); a pH of 7 is neutral. Pure rain is slightly acidic, with a pH of 5.6, because of dissolved carbon dioxide. In the northeastern US, industrial pollution leads to *acid rain* which is more acidic and whose pH is lower.[1] A random sample of 90 readings from Big Meadows, Shenandoah National Park, Virginia, had a mean pH of 4.6 and a standard deviation of 0.3.

(a) Find the 95% confidence interval for the pH of the rain in Big Meadows.

(b) What is the margin of error?

(c) Explain exactly what the confidence interval tells us.

(d) Would the 99% confidence interval be Longer_____Shorter_____Same length_____(check one)

(e) How would the confidence interval change if the standard deviation of the sample increased?
It would: Increase in length____Decrease in length_____Remain the same_____ (check one)

(f) How would the confidence interval change if the sample size quadrupled?
It would be (check one):
Four times as long____Twice as long___Half as long____A quarter as long___Same length_____

(g) Pure rain has a pH of 5.6. Compare this with the confidence interval. What can you conclude?

[1] www.epa.gov/acidrain. Data from National Atmospheric Deposition Program and the Central Virginia Governor's School students