Standard Deviation – Applied Problems

1. The data below are the lifetimes (in hours) for 10 light bulbs from a new brand that our school is considering for use in the football stadium light fixtures:



* 1. What is the value of the standard deviation of the lifetimes for the 10 light bulbs from the new brand? Show your calculations below.
  2. The standard deviation for the lifetimes of the bulbs from the brand currently in use is 40 hours. What does the standard deviation that you computed for the sample of light bulbs from the new brand tell you about how this brand might compare with the old brand?
  3. Replacing stadium light bulbs is difficult and requires special equipment. Because of this, rather than replace individual bulbs as they burn out, the school plans to replace *all* the stadium light bulbs as soon as one burns out. The mean lifetime is 2000 hours for both the current brand and the new brand under consideration, and the cost of the two brands is the same. Would you recommend that the school stay with the current brand or change to the new brand? Explain your reasoning.

1. A class of students took a test in Language Arts. The teacher determines that the mean grade on the exam is a 65%. She is concerned that this is very low, so she determines the standard deviation to see if it seems that most students scored close to the mean, or not. The teacher finds that the standard deviation is high. Interpret what might have caused this high standard deviation. Be detailed, but concise.
2. An employer wants to determine if the salaries in one department seem fair for all employees, or if there is a great disparity. He finds the average of the salaries in that department and then calculates the variance, and then the standard deviation. The employer finds that the standard deviation is slightly higher than he expected. Explain in some detail what might be causing the high standard deviation.
3. Consider the dotplots below showing the average temperature for the month of February 2006 for three cities. Which city would you expect to have the largest standard deviation in temperatures for the month? Explain how having this information might affect your choice of cities to which to move if given the opportunity. Be detailed, but concise.

