CSCI 241: HOMEWORK 3

Each question is worth 25 points. The assignment is due on Feb 13 in class. Show your work.

1. Prove that $\sqrt{3}$ is irrational. What proof technique did you use?

2. Let A be the set of positive even numbers less than 100. Let B be the set of positive numbers less than 100 that are multiples of 3. Let C be the set of positive numbers less than 100 that are multiples of 12. $D = (A \cap B) - C$. Express set D in words as I expressed the sets above (as in, positive numbers in a certain range with certain properties), and list the elements.

3. Use the definitions of intersection and set difference as logic formulas to show that $(A \cap B) - C = A \cap (B - C)$.

4. If $A - B = A - C$ can we conclude that $B = C$? If $A - B = C - B$ can we conclude that $A = C$? Argue your answers.