1. Given the following partial DNA sequence: (2 pts)

   a) Write the complementary strand (3’ to 5’).

   5’ CCCCCGTACCGGCGATCGGGAATCCCCGGAGATCCGTATTAGCCCGC 3’

   3’ ________________________________________________________________ 5’

   b) If this piece of DNA is digested with the restriction enzyme Hae III, which cuts at the following sequence, how many RE sites are there? ______

   Indicate the location(s) of the restriction site(s) by drawing a straight line through the DNA to show how it will be cut into fragments.

   HINT: Remember to look for the sequence reading left to right (5’ to 3’) across the top strand and that the DNA will be cut through both the top and bottom strands.

   c) How many DNA fragments will result from this RE digest? ______

   d) What are the sizes in base pairs (bp) of each resulting fragment? ___________________

2. Examine the image of the gel below. This represents information for a paternity test. Assume that the DNA was cut with one restriction enzyme. Based on what you have learned about gel electrophoresis, who is the likely father of the child? (1 pt)

   Lane 1 = Mother’s DNA
   Lane 2 = Infant’s DNA
   Lane 3 = Boyfriend #1’s DNA
   Lane 4 = Boyfriend #2’s DNA

   Potential father is: ______________

   Explain your reasoning:
3. Explain how DNA fragments are separated in gel electrophoresis. (1 pt)

4. Utilize the following skeletal data to determine the **ethnic ancestry** and **height** of the subject in question. Refer to your lab manual for formulas and tables, and show all calculations! (1 pt)

Sacral anterior width = 119 mm
Sacral anterior height = 130 mm
Oblique length of femur = 60 cm

Ethnicity = ___________________
Height = _____ feet, _____ inches