**BIOL 103 Alien Assignment 3**

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
  
http://www.hoglezoo.org/meet\_our\_animals/animal\_finder/arabian\_wildcat/

**\*\* Show ALL WORK.  
\*\* Show UNITS.**

**\*\*Submit ONLY Word file or PDF on Moodle.**

1. (20 pts) Propose a map of phylogeny of cat species, using the following information on genetic relatedness. Assume that the gene diverges at 1% per 500,000 years.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Percent Relatedness** | Leopard | Lion | Lynx | Puma | Tiger | Sabertooth cat | Fishing cat |
| Leopard | 100 | 82 | 88 | 84 | 82 | 76 | 84 |
| Lion |  | 100 | 82 | 82 | 92 | 76 | 82 |
| Lynx |  |  | 100 | 84 | 82 | 76 | 84 |
| Puma |  |  |  | 100 | 82 | 76 | 86 |
| Tiger |  |  |  |  | 100 | 76 | 82 |
| Sabertooth |  |  |  |  |  | 100 | 76 |
| Fishing cat |  |  |  |  |  |  | 100 |

2. (10 pts) What key traits do all the above cats share? Why do they all share these traits in common? Note: Internet may help. Cite any sources used.

3. (10 pts) An alien-cat population has evolved a mechanism of kin selection.  
  
A. Suppose an alien-cat has enough resources to raise 1 kitten on her own, or to help her litter-mate (sister) raise 4 kittens. Will she help her sister, or will she raise her own kitten? Why? Explain clearly, showing your math.

B. Suppose a mother cat emits hormones that suppress the fertility of her sons and daughters (but allow her to produce younger kittens that may be fertile.) How will the suppressed sons and daughters respond?

4. (10 pts) Could a population of alien-cats evolve into creatures adapted to a marine environment? Write a story (100-300 words) describing how specific adaptations might occur.