**Biology 103 Pandora 1:
Hammerhead**

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**\*\* Show ALL WORK.
\*\* Show UNITS.
\*\* Each question is worth 10 points.**

**1.** After a drunken brawl with the Klingons on the space station, Scotty brings one tribble onto the Enterprise. Each tribble produces a litter of 10 (and keeps living) every 12 hours.

A. Calculate how many tribbles there will be in 4 days.

B. Set up an Excel file to calculate the number of tribbles produced over 4 days. In Excel, plot your results (number of tribbles over time). Submit a copy of the Excel plot and data table (as Part 2 in the Moodle submission).

**2.** In the environment of the Enterprise:

A. How many hours would it take for 1 tribble to produce one million tribbles?

B. How many tribbles would you need initially to produce 1 million tribbles in 2 days?

**3.** On the space station, in the episode shown, what actually becomes of the tribble population, and why?

Describe a real-life example of a comparable occurrence in an ecosystem, and provide internet link (URL).

**4.** Scotty beams 3,000 tribbles off the Enterprise onto the Klingon ship. The Klingons poison the tribbles, so in 1 day their population falls to 200.

A. What is the half-life of the dying Tribbles? That is, how long does it take half the population to die?

B. Suppose the poisoned tribbles adapt to produce10 offspring per litter, but only half survive the poison, and the parent dies after one litter. What is the new doubling time of the poisoned tribbles?

**5.** On the planet Pandora, Dr. Augustine counts a herd of 520 hammerheads. Three years later, 220 baby hammerheads have been born, while 210 of the original hammerheads were killed by thanators.

Assuming these rates continue, how many years will it take to double the hammerhead population?

Suppose the miners kill off the thanators. Now how many years will it take to double the hammerheads?