**Extra Practice Problems (5.1 – 5.3)**

1. 







**(b) What is the doubling time for this population; that is, how long does it take the population to double in size?**

**(c) What is the continuous growth rate of the colony?**

**3.**

**Scientists observing owl and hawk populations collect the following data. Their initial count for the owl population is 245 owls, and the population grows by 3% per year. They initially observe 63 hawks, and this population doubles every 10 years.**

**(a) Find formulas for the size of the population of owls and hawks as functions of time.**

**(b) When will the populations be equal?**

**4.**

**Find the half-lives of each of the following substances.**

**(a) Tritium, which decays at an annual rate of 5.471% per year.**

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|  | **5.**  **The stellar magnitude http://edugen.wileyplus.com/edugen/courses/crs6226/kime9780470466445/c06/math/math023.gifof a star is approximately M = http://edugen.wileyplus.com/edugen/courses/crs6226/kime9780470466445/c06/math/math926.gif, where http://edugen.wileyplus.com/edugen/courses/crs6226/kime9780470466445/c06/math/math071.gif is the brightness of the star and http://edugen.wileyplus.com/edugen/courses/crs6226/kime9780470466445/c06/math/math927.gif is a constant.**   |  |  | | --- | --- | | **(a)** | **If the brightness of a star is increased by a factor of 5, by how much does the magnitude increase or decrease?** |   **(b) Let M1 and M2 represent the magnitude of two stars whose brightness are B1 and B2, respectively. Using log properties, find a simplified formula for the difference M2 – M1 in terms of B1 and B2.** |