

Homework 7

Do the following problems on a separate sheet of paper.

1. Evaluate the following using the rule $\log(a^b) = b\log(a)$. **Don't use a calculator!** Make sure you show all of your work.
 - (a) $\log(10)$
 - (b) $\log(1)$
 - (c) $\log(10^4)$
 - (d) $\log(100000000)$
 - (e) $\log(10^{-3})$
 - (f) $\log(0.001)$
2. Solve the following equations for x using the rules for logarithms:
 - (a) $\log(4^x) = 7$
 - (b) $3 \cdot 2^x = 384$
 - (c) $e^x + 4 = 10$
 - (d) $1000 \cdot \left(1 + \frac{.04}{12}\right)^x = 2000$
3. Annabelle's niece Sarah just had her 12th birthday. Fortunately, Annabelle is the owner of Annabelle Aerospace, which makes anti-shipping missiles for the US Navy. She gives Sarah a birthday present of \$70,000 in a college fund at 7%APR compounded monthly. How long will she have to wait before she has \$110,000 and can go to college?
4. Sarah is an impulsive spender, and decided to withdraw her money early and spend it on the world's largest jellyfish farm. She starts with 1000 jellyfish, and the population increases by 7% per week.
 - (a) How long does it take for the jellyfish population to double?
 - (b) How many jellyfish will she have in five months? (Figure one month is four weeks).
 - (c) How long will it take before she has 1,000,000 jellyfish, so that she can cash out and go to college early?