Spring, 1999
Peterson

MATH 124.

Homework 10.

DUE: Friday, April 9, 1999.

P1. Find 5-place decimal approximations in each case:

(1) $\ln(\sqrt{e}+1)$. (2) $e^{\sqrt{2}+1}$. (3) $\log_7(p)$. (4) $\log_{\sqrt{2}}(\sqrt{7}+1)$.

P2. Solve the following equations in two steps. First, find an exact solution for x, involving the $\ln$ function. Then find a four-place decimal approximation for x.

(1) $5^{2x-1}-3=8$.

(2) $2\cdot 5^{x+1}-7=21$.

(3) $3\cdot e^{2x+3}-7=5$.

P3. A person makes a one-time deposit of $3400 into an account that pays an annual APR of 7.3% with compounding . Find the worth of the account after 8 years if interest is

(1) Compounded annually.
(2) Compounded quarterly.
(3) Compounding monthly.
(4) Compounded daily (365 times yearly).
(5) Compounded continuously.

P4. A person makes a one-time deposit into an account that pays an APR 7.5% with compounding. How long does it take the account to triple in value if interest is

(1) Compounded annually? (2) Compounded monthly?

P5. A group of 1000 insects invades a region and begins to obey the law of natural growth. Three weeks later the insect population is 1331.

(1) Let $A(t)$ be the insect population t weeks after the invasion. Find a good expression for $A(t)$.
(2) Approximate the insect population two weeks after the population was 1331.
(3) Approximately how long does it take the insect population to double?
(4) Approximately how long does it take for the insect population to grow from 1000 to 100 000?

P6. We currently have 10 grams of a radioactive substance with a half-life of 150 years.

(1) Let $A(t)$ be the amount of the substance (in grams) that is still radioactive t years from now. Find a good expression for $A(t)$.

(2) Approximately how much of the substance will still be radioactive 50 years from now?

(3) Approximately how many years from now will the amount of the substance that is still radioactive be $\frac{1}{2}$ grams?