MAC1140 SEC29 HW 10-05-2007 4.6

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Due: 10-08-2007

Full Name: Sec#: Extra Credit Attempted?

1.
[4.6.1cPT]What is the amount in 5 years of $6,000 invested at 10.6% compounded continuously?

○ $6,000e^{0.53}$

○ $\frac{6,000}{e^{0.53}}$

○ $6,000e^{5.3}$

○ $\frac{6,000}{e^{5.3}}$

2.
[4.6.1dPT]A note will pay $5,689 at maturity in 8 years. How much is the note worth now, assuming continuous compounding at 3.9%?

○ $\frac{5,689}{e^{3.12}}$

○ $5,689e^{3.12}$

○ $5,689e^{0.312}$

○ $\frac{5,689}{e^{0.312}}$

3.

[4.6.2aPT]Find the effective rate of interest for 12% compounded quarterly.

○ $(1+\frac{0.12}{4})^4$

○ $(1+0.12)^{12}$

○ $(1+0.12)^{12}-1$

○ $(1+\frac{0.12}{4})^4-1$

4.

[4.6.2bPT]How many years will it take for an investment of \$30,000 to grow to \$70,000? Assume a rate of interest of 11% compounded continuously.

○ $\frac{\ln(\frac{7}{3})}{0.11}$

○ $\frac{\ln(\frac{3}{7})}{0.11}$

○ $\frac{\ln 7}{0.11 \ln 3}$

○ $\frac{\ln(\frac{7}{3})}{\ln(1+0.11)}$

5.

[4.6.2dPT]What interest rate, compounded continuously, will take an initial investment of \$10,000 to \$35,000 in 4 years?

○ $\frac{\ln \frac{10}{35}}{4}$

○ $\frac{\ln \frac{35}{10}}{4}$

○ $\frac{\ln 35}{4 \ln 10}$

○ $\frac{\ln 35}{40}$

6.

[4.7.1aPT]The size, P, of a certain insect population at time t (in days) obeys the function $P(t) = 600e^{0.06t}$. After how many days will the population reach 3600?

○ $\frac{\ln 6}{0.12}$

○ $\frac{\ln 6}{0.06}$

○ $\frac{\ln 6}{0.01}$

○ $\frac{\ln \frac{1}{6}}{0.06}$

7.

[4.7.1bPT]A culture of N bacteria obeys the law of uninhibited growth, $N(t) = N_0e^{kt}$. If 700 bacteria are present initially and there are 2100 after 1 hour, how many will be present in the culture after 3 hours?

○ $2100e^{3\ln 3}$

○ $2100e^{3\ln\frac{1}{3}}$

○ $700e^{3\ln\frac{1}{3}}$

○ $700e^{3\ln 3}$

8.
[4.7.1cPT]Iodine I-31 is a radioactive material that decays according to $A(t) = A_0e^{-0.053t}$, where A_0 is the initial amount present and $A(t)$ is the amount present at time t (in days). What is the half-life of iodine I-31?

○ $\frac{1-\ln 2}{0.053}$

○ $\frac{1}{0.053\ln\frac{1}{2}}$

○ $\frac{\ln\frac{1}{2}}{0.053}$

○ $\frac{\ln 2}{0.053}$

9.

[4.7.2aPT]Find the exponential function, $N(t) = N_oe^{kt}$, that satisfies the conditions $N(0) = 14$, $N(7) = 2$.

○ $N(t) = 2e^{(\frac{\ln 14}{7})t}$

○ $N(t) = 14e^{(\frac{\ln\frac{1}{2}}{2})t}$

○ $N(t) = 14e^{(\frac{\ln 7}{7})t}$

○ $N(t) = 14e^{(\frac{\ln\frac{1}{7}}{7})t}$