5.1B Applications of Exponential Functions

▼ Evaluating Exponential Functions

　　▼ Example: Find the salary using the exponential function

　　The average annual salary of an NBA player follows the exponential model

$$S(t) = 161.4(1.169)^t$$

　　where S(t) is the average annual salary in thousands of dollars and t is the number of years after 1980.

　　a. Find the average annual salary of an NBA player in 1980.

　　b. Find the average annual salary of an NBA player in 1990.

　　c. Find the average annual salary of an NBA player in 1998.

▼ Periodic Compound Interest

$$A = P \left(1 + \frac{r}{n}\right)^{nt}$$

P-principle or initial investment
r-annual interest rate
n-number of compounding in one year
t-time in years
A-Accrued amount

▼ Values of n

annually $(n = 1)$

semi-annually $(n = 2)$

quarterly $(n = 4)$

monthly $(n = 12)$

daily $(n = 365)$

▼ Example: Find the Future Value when interest is compounded quarterly

Astrid invests 300 dollars in a bank account paying 4% interest per year, compounded quarterly for 10 years. How much will Astrid have after 10 years?

▼ Continuous Compound Interest

$$A = Pe^{rt}$$

P-principle or initial investment
r-annual interest rate
t-time in years
A-Accrued amount

▼ Example: Find the Future Value when interest is compounded continuously

Astrid invests 300 dollars in a bank account paying 4% interest per year, compounded continuously for 10 years. How much will Astrid have after 10 years?

▼ Population Growth or Decay

$$P(t) = P_0 e^{kt}$$

P_0-initial amount

k-growth or decay rate

t-time

P-Population after time

▼ Example: Find the initial population

The Florida Fish and Wildlife Conservation Commission estimates that the black bear population is growing exponentially by 10% and follows the model $P(t) = P_0 e^{0.10t}$ where t is the the number of years since 1995. If there were an estimated 2850 black bears in 2005, how many black bears were present in 1995?