9. Finance A bank advertises that its 5% annual interest rate compounded daily is equivalent to a 5.13% effective annual yield. What does this mean?

b. 12 times a year? **c.** continuously?

WRITTEN EXERCISES

A

1. a. Evaluate $\left(1 + \frac{1}{n}\right)^n$ .when $n = 5000$, and $n = 5,000,000$.

b. Compare your answers in part (a) with an approximation for e.

2. a. Evaluate $\left(1 - \frac{1}{n}\right)^n$ for $n = 100$, $n = 10,000$, and $n = 1,000,000$.

b. Compare your answers in part (a) with an approximation for e^{-1}.

c. What appears to be $\lim\limits_{n \to \infty} \left(1 - \frac{1}{n}\right)^n$?

3. Which is larger, $e^{\sqrt{2}}$ or $\sqrt{2}^e$? Try to estimate before using your calculator.

4. Evaluate: **a.** $e^{0.08}$ **b.** $e^{-0.08}$ **c.** $e^{4/3}$

5. Finance Suppose you invest $100 at 6% annual interest. Calculate the amount that you would have after one year if the interest is compounded **(a)** quarterly, **(b)** monthly, **(c)** continuously.

6. Finance Repeat Exercise 5 if the annual rate is 8%.

7. Finance One hundred dollars deposited in a bank that compounds interest quarterly yields $107.50 over 1 year. Find the effective annual yield.

8. Finance After a year during which interest is compounded quarterly, an investment of $800 is worth $851. What is the effective annual yield?

9. With which plan would an investor earn more, Plan A or B?
Plan A: A 6% annual rate compounded annually over a 10-year period
Plan B: A 5.5% annual rate compounded quarterly over a 10-year period

10. With which plan would an investor earn more, Plan A or B?
Plan A: An 8% annual rate compounded quarterly for 5 years
Plan B: A 7.5% annual rate compounded daily for 5 years

11. Finance Suppose that $1000 is invested at 7% interest compounded continuously. How much money would be in the bank after 5 years?

12. Biology A population of ladybugs rapidly multiplies so that the population t days from now is given by $A(t) = 3000e^{0.01t}$.
a. How many ladybugs are present now?
b. How many will there be after a week?