LESSON 8.2

NAME _____ DATE _____

# Challenge: Skills and Applications

**For use with pages 456–461**

**In Exercises 1–4, decide whether each expression is positive or negative for $a < 0$ and $b > 1$.**

**1.** $-a^0$

**2.** $(-b)^0$

**3.** $a^0b^0$

**4.** $a^0 - b$

**In Exercises 5–8, evaluate the exponential expression. Write your answer as a whole number or a fraction in simplest form.**

**5.** $(4^{-1} \cdot 7)^{-2}$

**6.** $4^{-3} \cdot \left(\frac{5}{8}\right)^{-1}$

**7.** $(0.01)^{-3}$

**8.** $(0.02)^{-2}(0.04)^3$

**In Exercises 9–16, use the following information.**

Banks often compute interest over time periods shorter than 1 year. For example, "6% annual interest compounded semi-annually" means that instead of growing by 6% every year, your savings grows by 3% every half-year. In the formula $y = P(1 + r)^x$, $r = 0.03$ and $x =$ the number of half-year intervals in $t$ years. Find the value in each account, after $t$ years, for an initial investment $P$ of \$1500 at the given annual rate $I$.

**9.** $I = 4\%$, compounded quarterly, $t = 6$

**10.** $I = 8\%$, compounded semi-annually, $t = 8$

**11.** $I = 6\%$, compounded monthly, $t = 4$

**12.** $I = 10\%$, compounded quarterly, $t = 5$

**13.** $I = 5\%$, compounded monthly, $t = 8$

**14.** $I = 5\%$, compounded semi-annually, $t = 8$

**15.** $I = 5.5\%$, compounded semi-annually, $t = 8$

**16.** Compare your answers from Exercises 13 and 14. How much difference does compounding make in the value of the account? Compare your answers from Exercises 14 and 15. Does the rate of interest make more difference in the final value of the account than the number of times per year that the interest is compounded?