NAME _____ DATE _____

Practice 15

FOR USE WITH SECTION 3.2

Simplify.

1. 4^{-3} **2.** 2^{-4} **3.** 3^{-2} **4.** 5^{-4}

5. $49^{-1/2}$ **6.** 11^{0} **7.** $8^{-2/3}$ **8.** $25^{-3/2}$

Simplify using the properties of exponents.

9. $9^{1/4} \cdot 9^{1/4}$ **10.** $\frac{5^{1/2}}{5^{3/2}}$ **11.** $3^{5/2} \cdot 3^{1/2}$ **12.** $\frac{4^{5/2}}{4^{2}}$

13. $7^{2/3} \cdot 7^{-2/3}$ **14.** $\frac{6^{7/3}}{6^{1/3}}$ **15.** $64^{1/2} \cdot 64^{-1/6}$ **16.** $\frac{25^{7/4}}{25^{5/4}}$

17. $(4^{6})^{1/3}$ **18.** $(8^{0})^{5/3}$ **19.** $(16^{5/8})^{4/5}$ **20.** $(27^{1/2})^{4/3}$

The table below shows the amount of the U.S. national debt (the amount of money the U.S. government has borrowed) per U.S. citizen. (This is called the *per capita* debt.) Use this table in Exercises 21–24.

Year	1980	1981	1982	1983	1984	1985	1986
Interest	$3985	$4338	$4913	$5870	$6640	$7598	$8774

21. Find the average percent growth of the per capita national debt between 1980 and 1986.

22. Write an exponential equation that models the growth of the per capita national debt, as a function of the number of years after 1980.

23. Use the equation you found in Exercise 22 to predict the per capita national debt in 1995 and 2000.

24. Use the equation to estimate the per capita national debt in 1975. In 1975, the actual per capita national debt was $2475. Does this show that the per capita debt grew faster or more slowly before 1980 than after 1980?

25. Open-ended Problem Find a quantity in your daily life (an amount of time you spend at a particular activity, for example) that seems to have been growing exponentially during the past several years. Compile a table of values for this quantity and write an exponential function that models it. Use your function to predict the value of the quantity in 5 years. Do you think this prediction will be accurate? Explain why or why not.