Practice 21

FOR USE WITH SECTION 4.2

Write each equation in logarithmic form.

1.
$$2^5 = 32$$

2.
$$9^2 = 81$$

3.
$$3^5 = 243$$

4.
$$4^{-1/2} = \frac{1}{2}$$

5.
$$7^0 = 1$$

6.
$$4^{-3} = \frac{1}{64}$$

7.
$$(0.5)^3 = 0.125$$

8.
$$1000^{-1/3} = \frac{1}{10}$$

Write each equation in exponential form.

9.
$$\log_3 81 = 4$$

10.
$$\log_{1/2} 32 = -3$$

10.
$$\log_{1/2} 32 = -5$$
 11. $\log_5 \frac{1}{5} = -1$

12.
$$\log_2 64 = 6$$

13.
$$\log_8 16 = \frac{4}{3}$$

14.
$$\log_3 1 = 0$$

15.
$$\log_{0.09} 0.3 = \frac{1}{2}$$

16.
$$\log_{1/25} 125 = -\frac{3}{2}$$

Evaluate each logarithm.

20.
$$\ln e^4$$

21.
$$\log_2 \frac{1}{64}$$

24.
$$\log_{81} \frac{1}{3}$$

25. The atmospheric pressure (in $lb/in.^2$) at altitude x (in miles) above sea level is given by the equation

$$y = 14.7e^{-0.198x}$$
.

- **a**. Find the inverse of the given function.
- **b.** Predict the altitude at which the atmospheric pressure is 5 lb/in.².
- c. Find the altitude at which the atmospheric pressure is $\frac{1}{2}$ of what it is at sea
- **26.** Writing Evaluate several pairs of logarithms like $\log_3 27$ and $\log_{27} 3$, or log₄ 8 and log₈ 4. Describe any pattern that you notice. Make a conjecture about the relationship between $\log_a b$ and $\log_b a$, where a and b are positive numbers and neither is equal to 1.