# 6-3 Additional Practice

## Logarithms

**Complete the table.**

| Exercise | Exponential Form | Logarithmic Form |
|---|---|---|
| 1. | $4^3 = 64$ | $\log_4 64 = 3$ |
| 2. | $x = 10^{35}$ | $\log x = 35$ |
| 3. | $6^{-3} = \frac{1}{216}$ | $\log_6 \frac{1}{216} = -3$ |
| 4. | $x = \frac{e^8}{3}$ | $\ln(3x) = 8$ |
| 5. | $1000^0 = 1$ | $\log_{1000} 1 = 0$ |
| 6. | $5^{\frac{1}{2}} = \sqrt{5}$ | $\log_5 \sqrt{5} = \frac{1}{2}$ |

**Solve the equation for *x*. Show your work.**

**7.** $2 + \log_5 x = 3$

$\log_5 x = 1$

$x = 5^1$

$x = 5$

**8.** $4^{(x+2)} - 16 = 60$

$4^{(x+2)} = 76$

$\log_4^{76} = x + 2$

$x \approx 1.12$

**9.** $2 \ln (x-5) = 25$

$\ln(x-5) = 12.5$

$e^{12.5} = x - 5$

$x = e^{12.5} + 5$

**Evaluate each logarithmic expression.**

**10.** $\log_5 \frac{1}{625}$

$-4$

**11.** $\log_8 8^5$

$5$

**12.** $\log_3(-10)$

No solution

**13.** $\ln (-e)$

No solution

**14.** $\ln e^3$

$3$

**15.** $\log 150$

$\approx 2.176$

**16.** Deshawn invests $5,000 in a savings account that earns 6% annual interest, compounded continuously. How long will it take to double his money?

about 12 years

**17.** Compare the following values and determine which one is greater. Explain.

$\log_{0.5} 6$ and $\log_{0.5} 4$

$\log_{0.5} 6 \approx -2.58$ $\log_{0.5} 4 = -2$

So $\log_{0.5} 4$ is greater than $\log_{0.5} 6$.