

Unit 2 Review

Converting Between Logarithmic and Exponential Forms

Rewrite in logarithmic form.

2. $7^2 = 49$

$$\log_7 49 = 2$$

Rewrite in exponential form.

4. $\log_3 9 = 2$

$$3^2 = 9$$

Evaluating Logarithms

Evaluate each expression. Round to two decimal places, following the rules of rounding.

9. $\ln 12$

$$2.48$$

Solving Logarithmic Equations

Solve for x . Apply a property of logarithms when needed.

13. $\ln(2x - 8) - 1 = 3$

$$\begin{array}{r} +1 \quad +1 \\ \hline \ln(2x-8) = 4 \end{array}$$

$$e^4 = 2x - 8$$

$$\begin{array}{r} 54.60 = 2x - 8 \\ +8 \qquad +8 \end{array}$$

$$\begin{array}{r} 62.60 = 2x \\ \hline 2 \qquad 2 \end{array}$$

$$\boxed{31.30 = x}$$

15. $\log_4 3x^2 + \log_4 2x = 4$

$$\log_4(3x^2 \cdot 2x) = 4$$

$$\log_4(6x^3) = 4 \quad \sqrt[4]{42.67} \sqrt[3]{x}$$

$$4^4 = 6x^3$$

$$\frac{256}{6} = \frac{6x^3}{6} \quad \boxed{x = 3.49}$$

Solving Exponential Equations

Solve for x.

18. $5^x = 22$

$$\log_5 22 = x$$

$$x = 1.92$$

23. $10^x = 4^{2x-3}$

$$\log 10^x = \log 4^{2x-3}$$

$$x(\log 10) = (2x-3)\log 4$$

$$x = (2x-3)0.60$$

$$x = 1.2x - 1.8$$

$$\begin{array}{r} x = 1.2x - 1.8 \\ -1.2x \quad -1.2x \\ \hline \end{array}$$

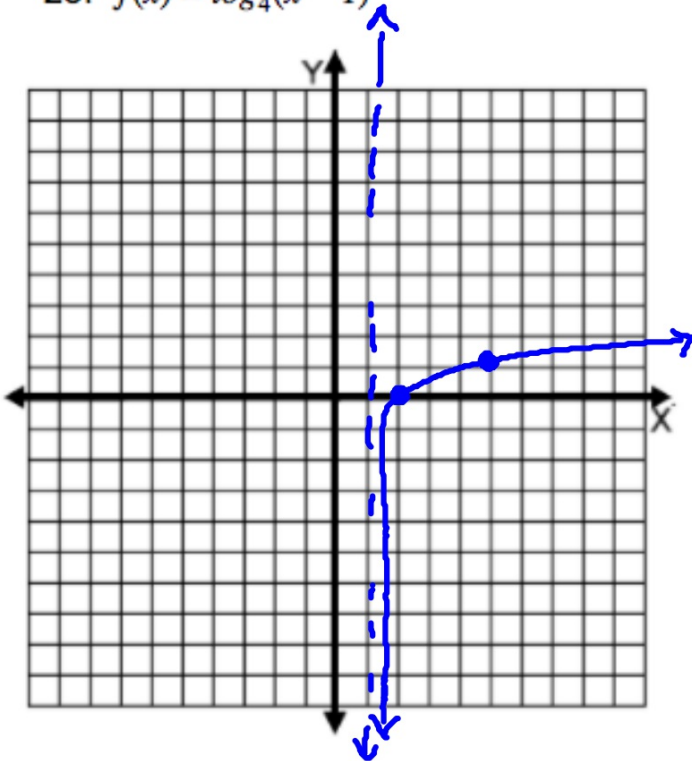
$$\begin{array}{r} -0.2x = -1.8 \\ \hline -0.2 \quad -0.2 \end{array}$$

$$\boxed{x = 9}$$

Graphs of Exponential and Logarithmic Functions

Graph each function by using your calculator to generate the t-table. State the domain, range, and asymptote.

25. $f(x) = \log_4(x - 1)$



Domain: $(1, \infty)$

Range: $(-\infty, \infty)$

Vertical Asymptote:

$$x = 1$$

Growth and Decay

26. The number of bacteria present in a colony is 180 at 11 a.m. and the number of bacteria doubles every hour. How many will be present at 8 p.m.?

$$y = P(b)^t$$

$$y = 180(2)^9$$

$$y = 92,160 \text{ bacteria}$$

Compound Interest

32. How much money must be invested at 6.5% interest compounded quarterly for \$50,000 to be available in 7 years?

$$A = P \left(1 + \frac{r}{n}\right)^{nt}$$

$$A = 50000$$

$$P = ??$$

$$r = 6.5\% \rightarrow 0.065$$

$$n = 4$$

$$t = 7$$

$$50000 = P \left(1 + \frac{0.065}{4}\right)^{4(7)}$$

$$\frac{50000}{1.57} = \frac{P(1.57)}{1.57}$$

$$P = \$31847.13$$

Homework is to Finish the Review