

### Ch 3 Test Review

#### NO CALCULATOR

##### Evaluate.

1.  $\log_5 125$

2.  $\log(0.001)$

3.  $2^{\log_2 16}$

4.  $\log_9 1$

5.  $\log_3 \frac{1}{9}$

6.  $\ln e^7$

7.  $\log_{64} 4$

8.  $e^{8 \ln \frac{1}{e}}$

##### Expand.

9.  $\log_6 \sqrt{\frac{a^2 - 3}{w^5}}$

10.  $\log_7 \frac{a^6(b-4)^3}{c^2 + 2}$

##### Condense.

11.  $\log a - 3 \log b - \log(c + 2) + \frac{3}{2} \log d$

12.  $\frac{1}{3} \ln x + \frac{2}{3} \ln x - \frac{5}{3} \ln x$

##### Solve.

13.  $\log_6 x + \log_6(x + 1) = 1$

14.  $\log_3(x^2 - 3) = \log_3 2 + \log_3 x$

15.  $\ln e^{3x+5} = 11$

16.  $\log_x 125 = \frac{3}{2}$

17.  $3\sqrt{27} = 3^{4x}$

18.  $3^x - 5 + 4 \cdot 3^{-x} = 0$

19.  $\log_4(3x + 1) - \log_4(x - 4) = \log_4 2$

20.  $\ln^4 \sqrt{x-1} = 1$

21. If  $f(x) = \log(x + 3)$ , find  $f^{-1}(2)$

22.  $\frac{e^x + e^{-x}}{-2} = -8$

23.  $e^{2x} \ln x + e^{2x} = 0$

Sketch each function below. Make sure to label the asymptotes! Then State the domain and range of each graph in any notation.

24.  $y = 3 \cdot 5^{x-1} + 2$

25.  $y = 3^{-x}$

26.  $y = \log_3 x - 2$

27.  $y = \log_3(-x)$

Evaluate the logarithm using the properties of logarithms, given that  $\log_b 2 \approx 0.3562$ ,  $\log_b 3 \approx 0.5646$ , and  $\log_b 5 \approx 0.8271$ .

28.  $\log_b 30$

29.  $\log_b \sqrt{5}$

30.  $\log_b \frac{1}{50}$

#### CALCULATOR – Round all answers to 3 decimal places.

31. Solve:  $5^{2x-7} = 11$

32. Solve:  $6^{9-x} = 4^{3x+1}$

33. Evaluate:  $\log_7 22$

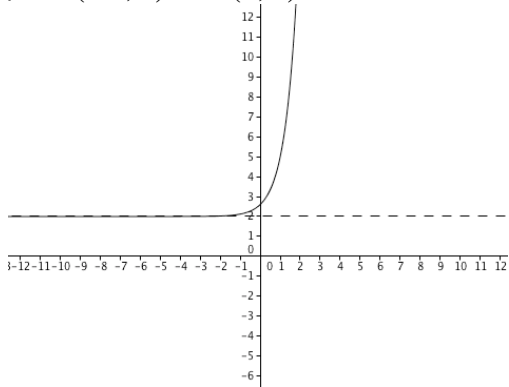
34. You deposit \$5,500 into an account that pays 7.25% interest, compounded continuously. How long will it take for the money to triple?

35. You deposit \$7,500 into a savings account for which the interest is compounded monthly at a rate of 2.3%. How much interest accrues over 4 years?

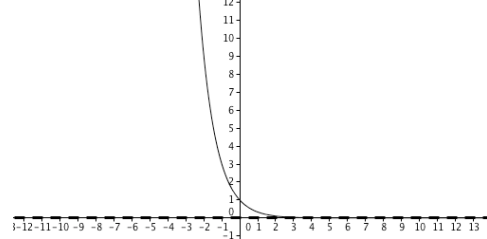
36. The half-life of radioactive uranium ( $^{234}\text{U}$ ) is 245,500 years. What percent of the present amount of radioactive uranium will remain after 5000 years?

### Ch 3 Review Answers

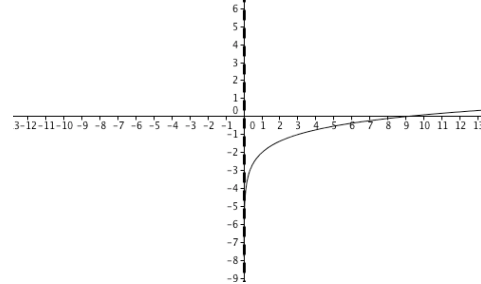
1. 3
2. -3
3. 16
4. 0
5. -2
6. 7
7.  $1/3$
8.  $\frac{1}{8^9}$
9.  $\frac{1}{2} \log_6(a^2 - 3) - \frac{5}{2} \log_6 w$
10.  $6 \log_7 a + 3 \log_7(b - 4) - \log_7(c^2 + 2)$
11.  $\log \frac{a\sqrt{d^3}}{b^3(c+2)}$
12.  $\ln \frac{1}{\sqrt[3]{x^2}}$
13. 2
14. 3
15. 2
16. 25
17.  $5/8$
18.  $\circ, \frac{\log 4}{\log 3} \text{ or } \frac{\ln 4}{\ln 3}$
19. No solution
20.  $e^4 + 1$
21. 97
22.  $\ln(8 + 3\sqrt{7}), \ln(8 - 3\sqrt{7})$
23.  $1/e$
24. D:  $(-\infty, \infty)$ , R:  $(2, \infty)$



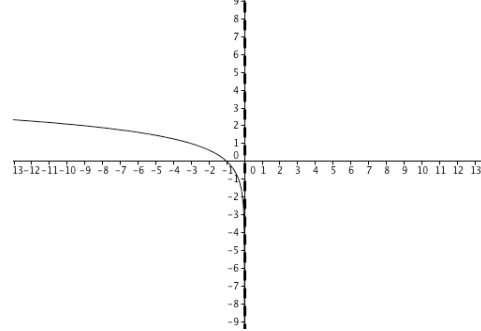
25. D:  $(-\infty, \infty)$ , R:  $(0, \infty)$



26. D:  $(0, \infty)$ , R:  $(-\infty, \infty)$



27. D:  $(-\infty, 0)$ , R:  $(-\infty, \infty)$



28. 1.7479
29. 0.4136
30. -2.010
31. 4.245
32. 2.477
33. 1.588
34. 15.153 years
35. \$722.01
36. 98.598%