

Algebra 2H
Handout 8R--Chapter 8 Review

Part 1. Give exact answers in simplest form. NO CALCULATORS, NO DECIMALS.

Solve for x.

1. $\log_x \frac{1}{25} = \frac{-2}{3}$

2. $\log_{1/16} x = \frac{5}{4}$

3. $\ln(2x+5) + \ln(x+2) = \ln(4x+13)$

4. $2\log x - \log 4 = 2$

5. $\left(\frac{1}{4}\right)^{1-4x} = 32^{x-1}$

6. Solve for x. Leave the answer in terms of "e". $\ln(x+2) = 5$

7. Find the inverse of $y = \ln 9x^2$. Express the answer in terms of "e".

Evaluate.

8. $\log_{\sqrt{6}} 4 + 2\log_{\sqrt{6}} 3$

9. $4\log_4 2 - \log_{27} 3$

Condense to a single, simplified logarithm.

10. $\frac{2}{3}\log_2 x + 5\log_2 y - 3$

11. $3\ln 4 + 6$

12. $3[\log(x-2) + 2\log(x+1) - \log(x+2) - 5\log(x-1)]$

13. Expand completely and simplify. $\log_3 \left(\frac{9A^2}{\sqrt[5]{B^2}} \right)$

14. If $\log_a 2 = x$ and $\log_a 3 = y$, find $\log_a \sqrt[3]{\frac{2}{9}}$.

Simplify to a single power of e.

15. $\frac{(e^{-3} \cdot e^{4x})^2}{e^5}$

16. $\sqrt[4]{625e^{12}}$

Part 2. Round decimal answers to the nearest hundredth where appropriate, unless otherwise specified.

Solve for x.

17. $50^{2x-1} + 7 = 407$

18. $2e^{3x+5} = 14$

19. $5^{2x+1} = 2^{4x-3}$

Evaluate.

20. $\log_3 8$

21. $\ln 18 - \frac{1}{2} \ln 36$

22. Write an exponential function $y = ab^x$ (with $b > 0$) that contains the points (1, 16) and (3, 36).
(do not use decimals for a and b)

23. Write a power function $y = ax^b$ that contains the points (2, 28) and (8, 192).

24. The epidemic began with 30 persons infected. The number of infected persons increased by 47% each day after the epidemic began.

a) Write an exponential growth model for the number of infected persons (I), t days after the epidemic began.

b) How many persons were infected 1 week after the epidemic began?

c) To the nearest day, about how many days did it take for 6,600 persons to be infected?

25. The output power P (in watts) of a satellite is given by $P = 50e^{-t/250}$, where t is the number of days that the satellite has been in operation.

a) To the nearest watt, compute the power output of the satellite on the 45th day.

b) If the equipment aboard the satellite requires 15 watts of power, about how long, to the nearest day, will the satellite continue to operate?

26. If \$10,000 is invested at an annual interest rate of 3.5% compounded semiannually, how much will the investment be worth at the end of 2 years? Use the formula $A = P\left(1 + \frac{r}{n}\right)^{nt}$ and round the answer to the nearest cent.

Part 3. Graph each of the following. Show asymptotes and list and locate at least 3 points on each graph, including the x - or y -intercept. State the domain and range.

27. $y = -3(2)^x + 2$ 28. $y = 2\left(\frac{1}{3}\right)^{x+1} - 2$ 29. $y = 2e^{-x} + 3$

30. $y = \frac{1}{2}e^{x-1} - 1$ 31. $y = \log_{1/2}(x+3)$ 32. $y = \log_3 x - 4$

33. $y = \ln x + 2$ 34. $y = \ln(x-3)$



Answers: 1. 125 2. $\frac{1}{32}$ 3. $\frac{1}{2}$ 4. 20 5. -1 6. $e^5 - 2$ 7. $y = \frac{\sqrt{e^x}}{3}$ 8. 4 9. $1\frac{2}{3}$

10. $\log_2 \frac{y^5 \sqrt[3]{x^2}}{8}$ 11. $\ln 64e^6$ 12. $\log \frac{(x-2)^3 (x+1)^6}{(x+2)^3 (x-1)^{15}}$ 13. $2 + 2 \log_3 A - \frac{2}{5} \log_3 B$

14. $\frac{1}{3}x - \frac{2}{3}y$ 15. e^{8x-11} 16. $5e^3$ 17. 1.27 18. -1.02 19. -8.27 20. 1.89

21. 1.10 22. $y = \frac{32}{3}\left(\frac{3}{2}\right)^x$ 23. $y = 10.69x^{1.39}$ 24. a) $I = 30(1.47)^t$ b) 445 persons c) 14 days

25. a) 42 watts b) 301 days 26. \$10,718.59