

Algebra 2—H
8.6 Exponential Equations
and Review

HW # _____

Name _____

Date _____

Solve for x . Round answers for #4–7 to the nearest thousandth.

| | | |
|----------------------------|--|---|
| 1. $4^{1-x} = \frac{1}{8}$ | 2. $27^{2x-1} = 9^{x+2}$ | 3. $49^{x-2} = 7\sqrt{7}$ |
| 4. $30^{-x} = 5$ | 5. $3^{2x-5} + 1 = 8$ | 6. $e^{-2x} = 3$ |
| 7. $3e^{2x+1} = 18$ | 8. $\ln(4x+1) - \ln 6x = \ln(5x+2) - \ln 8x$ | 9. $\frac{1}{2}(\log_3(x+2) + \log_3(x-2)) = 2$ |

() - Answers: 1. $\frac{5}{2}$ 2. $\frac{7}{4}$ 3. $\frac{11}{4}$ 4. $\approx -.473$ 5. ≈ 3.386 6. $\approx -.549$ 7. $\approx .396$ 8. 2 - 9. $\sqrt{85}$

10. Use logs to evaluate $\log_5 9$. Round answer to the nearest thousandth.

11. Solve for x . Leave answers in terms of e .
 $|\ln x| = 1$

12. A new car costs \$16,000 and decreases in value by 10% each year.

(a) Using the exponential decay model $V = a(1-r)^t$, write an equation for the car's yearly value.

(b) To the nearest tenth of a year, in how many years will the car's value be half of its original value?

13. Suppose that \$ 10, 000 is invested at an annual rate of 5.5% with interest compounded continuously. Using the formula $A = Pe^{rt}$, how long will it take until the original investment is worth \$ 12, 000? (Round to the nearest tenth of a year.)

Answers: 10. 1.365 11. $e, \frac{1}{e}$ 12(a) $V = 16000(.9)^t$ (b) 6.6 yrs 13. 3.3 yrs