I. Tell whether the function shows growth or decay. Then find the percent of increase or decrease. Find some points, and then graph. Finally, give the domain and range.

a. \( y = 2^x \)

Growth or Decay? _______________
Percent Increase/Decrease? ____________
Domain: __________  Range: __________

b. \( y = \frac{1}{2} \left( \frac{1}{4} \right)^x \)

Growth or Decay? _______________
Percent Increase/Decrease? ____________
Domain: __________  Range: __________

II. Write an exponential function \( y = ab^x \) to model the information. Then use your model to make the requested prediction.

3. Suppose you buy a computer that costs $1150 and expect for its value to depreciate by 42% each year. What will be the computer’s resale value in 3 years?

4. The number of bacteria in a culture increases by 12% every hour until available space is depleted. 200 bacteria are present to start. Predict the number of bacteria present after 48 hours.

III. Write an exponential function \( y = ab^x \) to model the information. Then use your calculator to estimate the time.

5. If a stock priced at $27 increases at a rate of 6.04% each year, when will it be worth approximately $100? Round to the nearest tenth of a year.

6. If $28,500 automobile depreciates at a rate of 15% each year, when will it be worth approximately $12,000? Round to the nearest tenth of a year.
IV. Given \( f(x) \), find the equation of its inverse, \( f^{-1}(x) \).

7. \( f(x) = \frac{x}{7} + 5 \)

8. \( f(x) = -2x - 7 \)

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V. Rewrite each equation in logarithmic form.

9. \( \left( \frac{1}{2} \right)^{-4} = 16 \)

10. \( 5^3 = 125 \)

11. \( 10^{-4} = 0.0001 \)

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VI. Rewrite each equation in exponential form.

12. \( \log_2 32 = 5 \)

13. \( \log 1000 = 3 \)

14. \( \log_3 \frac{1}{81} = -4 \)

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VII. Evaluate each logarithm WITHOUT the calculator.

15. \( \log_4 16 \)

16. \( \log 1 \)

17. \( \log_\frac{1}{3} 27 \)

18. \( \log_5 125 \)

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VIII. More with Logarithms.

19. Use the given \( x \) -values to graph each function. Then graph its inverse. Give the equation of the inverse, as well as the domain and range for each function.

\[ f(x) = \left( \frac{1}{2} \right)^x \] for \( x = -3, -1, 0, 1, \) and \( 2 \)