

Solve the following word problems.

1. You purchase a stereo system for \$830. After a 3 month trial period, the value of the stereo system decreases 13% each year. Write an exponential decay model for the value of the stereo system in terms of the number of year since the purchase. What was the value of the system after 3 years?

2. A house was purchased for \$130,000 in 1995. If the value of the home increases by 5% per year, what is it worth in the year 2020?

3. A diamond ring was purchased twenty years ago for \$750. The value of the ring increased by 8% each year. What is the value of the ring today?

4. You deposit \$1500 in an account that pays 5% annual interest. Find the balance after 2 years if the interest is compounded quarterly.

5. You deposit \$750 in an account that pays 8% annual interest. Find the balance after 5 years if the interest is compounded quarterly.

6. You deposit \$2500 in an account that pays 2.5% annual interest. Find the balance after 10 years if the interest is compounded daily.

7. You deposit \$250 in an account that pays 7% annual interest. Find the balance after 1 year if the interest is compounded annually.

Simplify the expression.

8. $e^7 \cdot e^{-4}$

9. $e^{-2} \cdot e^{-6}$

10. $(e^4)^3$

11. $(e^{-5})^{-6}$

12. $\frac{e^6}{e^{-5}}$

13. $(3e^4)^2$

14. $(e^3)^{-3}$

15. $(5e^3)^2$

16. $\left(\frac{e}{5}\right)^{-1}$

17. $\left(\frac{e}{8}\right)^{-2}$

18. $-5e \cdot 4e^4$

19. $e^{3x} \cdot 4^{1-3x}$

20. $e^{6x} \cdot 4^{2-9x}$

21. $e^4(4e^4)^2$

22. $e^9(7e^6)^2$