SHOW ALL WORK to receive credit.

1. Find the value of $1000 deposited for 10 years in an account paying 6% annual interest compounded monthly.

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2. How much money must be deposited now in an account paying 8% annual interest, compounded quarterly, to have a balance of $1000 after 10 years?

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3. Write an exponential function to model the situation, then estimate the value of the function after 5 years (to the nearest whole number). A population of 390 animals that decreases at an annual rate of 11%.

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4. Marion decides to invest $6000 at 5% interest compounded continuously. Find the value of the investment after seven years.

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5. Suppose the value of a house in Marshall County in t years can be modeled by the function $V(t) = V_o e^{0.087t}$ where V_o is the present value of the house.
   a. Find how much time t it will take for the value of a house in Marshall County to double.

Evaluate the expression without using a calculator.

6. $\log_2 0.25$

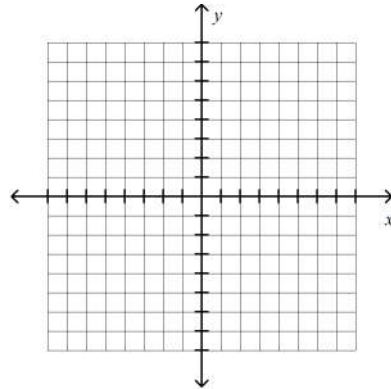7. $\log_{\frac{1}{2}} 8$

8. $\ln e^2$

9. $\log_2 16$

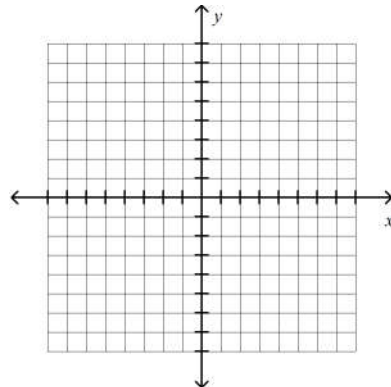10. $\log_7 \dfrac{1}{49}$

11. $\ln e^{-4}$.

12. $\log 10,000$

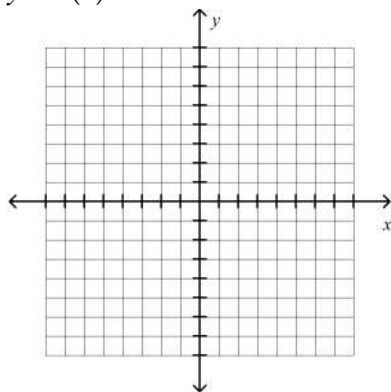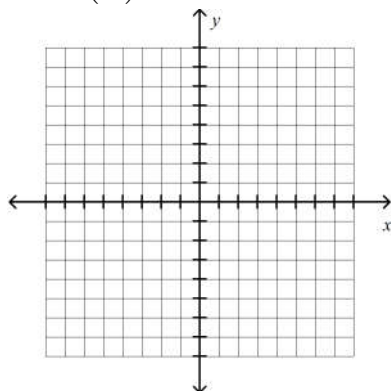**Graph the function. State the domain and range.**

13. $y = \log_4 x$

14. $y = \log_2 (x + 1)$

15. $y = 2(3)^{x-1} + 4$

16. $y = -3\left(\dfrac{1}{2}\right)^{x} + 6$

17. Condense the expression $\log_4 3 + 3\log_4 2$.

.

18. Expand the expression. $\ln\dfrac{2x}{y^4}$

.

Solve:

19. $\dfrac{1}{9} = 27^{7x-6}$

20. $10^{4x-1} = 1000$

.

21. $6^{-0.2x} - 3 = 7$

.

22. $e^{-3x} = 7.1$

.

Solve the equation. Check for extraneous solutions.

23. $\ln(x+7) = \ln(3x-5)$

.

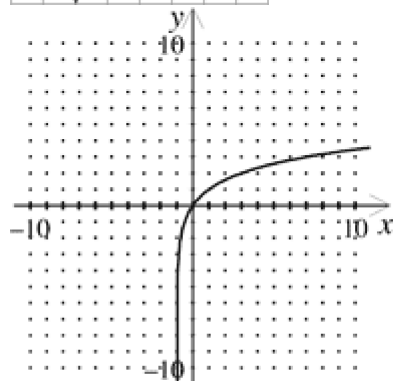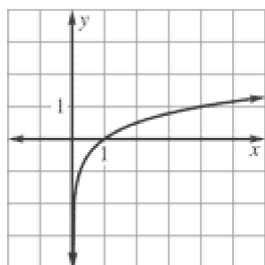24. $\log_4(x+6) + \log_4 x = 2$

.

25. $\log(x+2) = -\log(x-1) + 1$

.

26. $\log_5(3x+9) = 2$
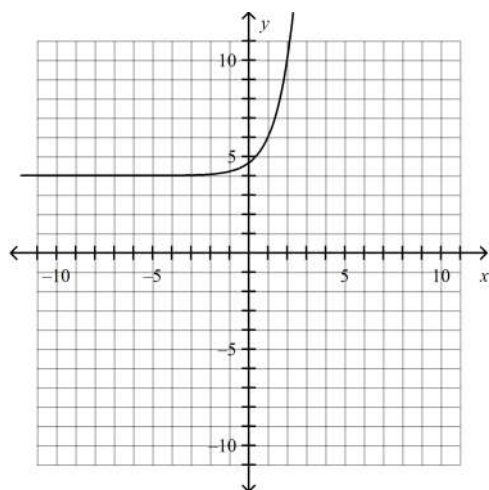
SHOW ALL WORK to receive credit.
Answer Section

1. $1819.40
2. $452.89
3. $f(x) = 390(0.89)^{x}$; 218
4. $8514.41
5. $2 = e^{0.087t}, t = \dfrac{\ln 2}{0.087} \approx 7.97$ or about 8 years.
6. –2
7. –3
8. 2
9. 4
10. –2
11. -4
12. 4
13. Domain: $x > 0$
    Range: all real numbers

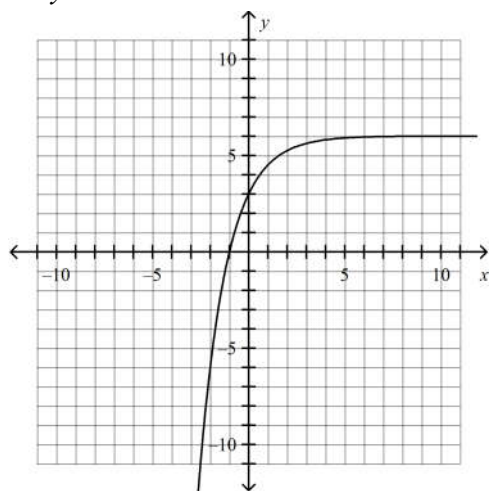

14.

Domain: $x > -1$; Range: all real numbers

15.

D: All real numbers
R: $y > 4$

16.

D: All real numbers
R: $y < 6$

17. $\log_4 24$

18. $\ln 2 + \ln x - 4\ln y$

19. $\dfrac{16}{21}$

20. 1

21. $x = -6.425$

22. -0.6534

23. $x = 6$

24. 2

25. 3

26. $\dfrac{16}{3}$