Sketch a graph of each of the following functions.
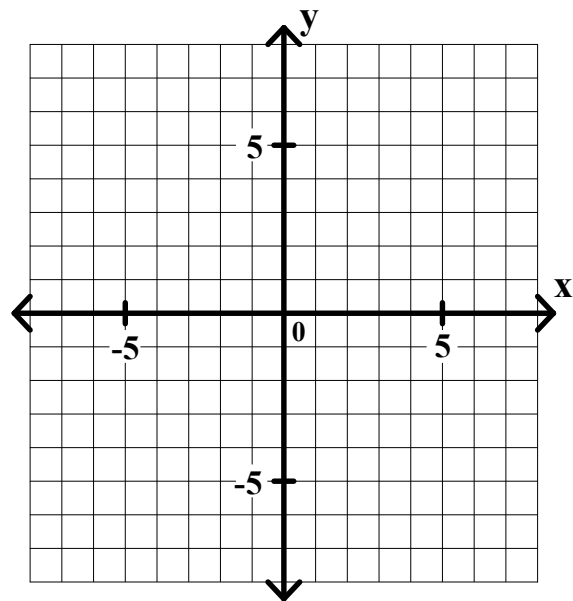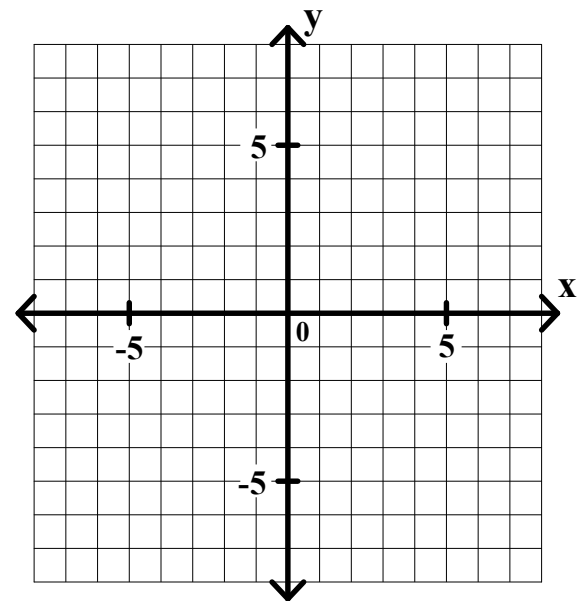
1. $y = 3^x$

2. $y = \log_3 x$

Find each of the following without using a calculator.

3. $\log_5 125 =$ _____

4. $\log_5 0.04 =$ _____

5. $\log_9 243 =$ _____

Solve each of the following equations, without using a calculator.

6. $9^{(2x-3)} = 27^x$

7. $\log_3 x + \log_3 (x - 6) = 3$

8. $4^x = 0.25$

9. $\log_3 (6x - 4) - \log_3 (2x - 1) = \log_3 (x + 1)$

Complete each of the following properties of logarithms.

10. $\log_B 1 = $ _____

11. $\log_B B = $ _____

12. $\log_B(xy) = $ _____

13. $\log_B(x/y) = $ _____

Let $w = \log_B 2$, $x = \log_B 3$, and $y = \log_B 5$. **Express each of the following in terms of w, x, and/or y.**

14. $\log_B 6 = $ _____

15. $\log_B 125 = $ _____

16. $\log_B 0.4 = $ _____

17. $\log_B(3B^3) = $ _____

Find each of the following. Round your answers to two decimal places.

18. $\log_4 100 = $ _____

19. $\log_2 e^2 = $ _____

Express each of the following as the log of a single expression.

20. $2\ln x - \ln y + 5\ln z = $ _____

21. $.25(\log_2 x + \log_2 y) = $ _____

Solve each of the following problems. (Show any equation you use to find your solution.)

22. $1000 is invested at 6.5% per year compounded quarterly. What will the balance be after 20 years?

_____

Solve each of the following problems. (Show any equation you use to find your solution.)

23. $1000 is invested at 9% per year compounded continuously. What will be the balance after 20 years?

_____

Solve each of the following equations. Express your solutions rounded to two decimal places.

24. $e^x = 10$

25. $\ln x = 1.75$

26. $e^{(3x-2)} = 6$

27. $\log x + \log(3x + 1) = 2$