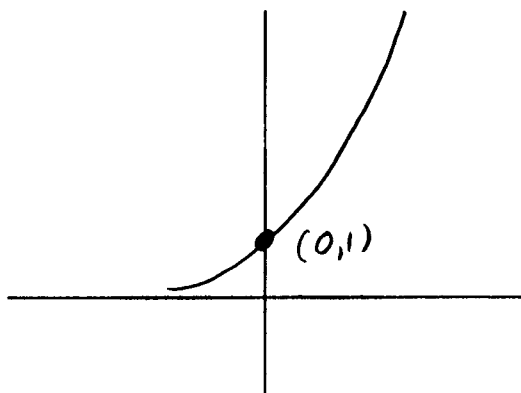
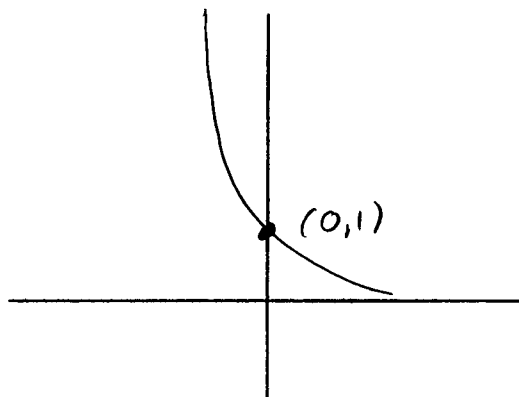


P-38 Sketch each exponential function.

1. $y = a^x$ where $a > 1$



2. $y = a^x$ where $0 < a < 1$

Solve each equation for y .

3. $2^y = 8$

$y = 3$

5. $(\frac{1}{2})^y = \frac{1}{16}$

$y = 4$

7. $10^y = 100$

$y = 2$

4. $2^y = \frac{1}{4}$

$y = -2$

6. $(\frac{1}{2})^y = 4$

$y = -2$

8. $10^y = \frac{1}{10}$

$y = -1$

In each of the above problems, you were able to solve the equation $a^y = x$ for the y given a value for x by applying BACKWARDS your knowledge of exponential functions. This new function is called the *logarithm to base a* and it is written

$$y = \log_a(x).$$

Find the value of each logarithm.

9. $\log_2(8) = 3$

13. $\log_{10}(\frac{1}{1000}) = -3$

17. $\log_3(\frac{1}{27}) = -3$

10. $\log_2(\frac{1}{4}) = -2$

14. $\log_{10}(1) = 0$

18. $\log_8(64) = 2$

11. $\log_2(2) = 1$

15. $\log_{1/2}(\frac{1}{4}) = 2$

19. $\log_e(e) = 1$

12. $\log_{10}(100) = 2$

16. $\log_{1/2}(4) = -2$

20. $\log_e(1) = 0$