Change to logarithmic form:

1. $3^4 = 81$

2. $\left(\dfrac{1}{4}\right)^{-1} = 4$

3. $11^{-2} = \dfrac{1}{121}$

4. $15^1 = 15$

Change to exponential form:

5. $\log_6 216 = 3$

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

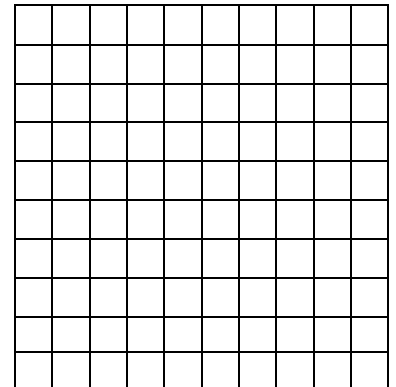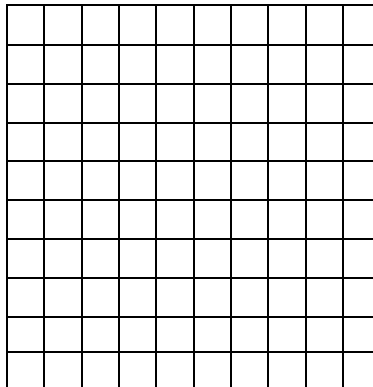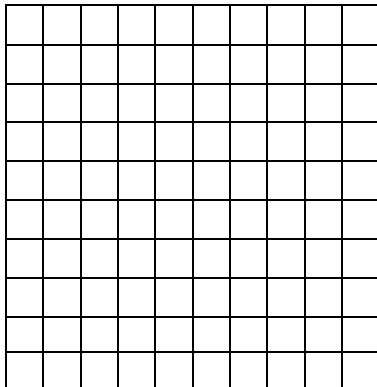7. $\log_{16} \dfrac{1}{4} = -\dfrac{1}{2}$

8. $\log 1 = 0$

Sketch the graphs and answer the following questions.

9. $f(x) = 3^x + 1$

10. $f(x) = 2^{x-1} - 1$

11. $f(x) = \left(\dfrac{1}{2}\right)^{x+1}$

Domain _____   Domain _____   Domain _____

Range _____   Range _____   Range _____

Asymptote? _____   Asymptote? _____   Asymptote? _____

End Behavior?   End Behavior?   End Behavior?

Parent Function?   Parent Function?   Parent Function?

12. Find the 15th term of the sequence: 10, 2, -6, -14, …. Then find the sum of the first 15 terms.

13. Find S_9 for -8 +1.6 – 3.2 + 0.64 - …

14. Evaluate.

$$\sum_{k=1}^{30} 12k + 2$$

15. Find the infinite sum, if possible: $24 + 6 + 1.5 + .375 + \ldots$

16. Consider the function $h(x) = 4\log_6(x - 5)$
   A. Identify the parent function.

   B. Describe the transformations of h(x) from the parent function identified above.

   C. State the domain, range, and any asymptotes for h(x).

17. A new car is purchased for $28,000. Sadly, it depreciates by 13% annually. When will the car be worth a quarter of its original value?

Solve for *x*:

18. $\log_{1/2} 8 = x$

19. $\log_x 32 = -5$

20. $8^x = \dfrac{1}{64}$

21. $3^x = 81$

22. $2^x = 8^{x+1}$

23. $9^{x-1} = 27^{3-x}$

24. $\log_8(x^2 - 2x) = \log_8 3$

25. $\ln\left(\dfrac{x}{2}\right) = \ln\left(\dfrac{3}{x+1}\right)$

Simplify:

26. $\ln e$

27. $\log 1$

28. $6\log_5 125$

29. $\log_7 7^{-3x}$

30. Daniel invests $1500 in a bank with an interest rate of 7.2% that is compounded continuously. How much money will be in the bank after 13 years?