Logarithms Practice (for 11th grade workshop)

The Laws of Logarithms

In the Logarithms unit of our *10th Grade Workbook*, the students are led to discover the laws of logarithms for themselves. Here they are:

- $\log_b M \cdot N \leftrightarrow \log_b M + \log_b N$
- $\log_b (^M/_N) \leftrightarrow \log_b M - \log_b N$
- $\log_b N^k \leftrightarrow k \cdot \log_b N$
- $\log_b (^1/_N) \leftrightarrow -\log_b N$
- $\frac{1}{\log_b a} \leftrightarrow \log_a b$
- $\log_b (b^k) \rightarrow k$
- $b^{\log_b N} \rightarrow N$

(From Logarithms – Part III, Problem Set #1, p51)

Evaluate by using the Properties of Logs.

27) $\log_4(64 \cdot 16)$

28) $\log_5 \left(\frac{625}{125} \right)$

29) $\log_8 64^5$

30) $\log_3 3^{12}$

31) $\log_6 6^{14}$

32) $11^{\log_{11} 8}$

(From Logarithms – Part III, Problem Set #4, p55)

7) $\log_4 (12x) = 5$

14b) $15,000 is deposited into a bank account at 3.0092% APR where the interest is compounded quarterly. How long will it take the money to triple.