

Log homework 1030-1

- Write a sentence to describe what this means: $\log_b a$. Here's the beginning: " $\log_b a$ is the power that I raise..."
- Write as a log
example $2^{-3} = 0.125 \rightarrow \log_2 0.125 = -3$
 - $4^5 = 1024$
 - $10^{-3} = 0.001$
- Write as an exponential
example $\log_5 625 = 4 \rightarrow 5^4 = 625$
 - $\log_7 49 = 2$
 - $\log 10 = 1$
- Solve for y
 - $y = \log 1000$
 - $1.02^y = 3$
 - $7^y = 0.35$
 - $3^y + 1 = 12.6$
 - $\frac{5(10,000^y)+11}{0.01} = 25,000$
- You have \$1000 in account at 7% APR compounding annually. How long will it take so that you have \$3000? (Answer in years)
- You have \$1000 in account at 7% APR compounding monthly. How long will it take for you to have \$3000? (Answer in years and months) Compare with your last answer.
- You can get an account at 6% APR compounding monthly. How long will it take for your initial deposit to double? (Answer in years and months)

Harder problems:

- You are depositing \$150 per month into a savings account with an APR of 4% compounded monthly. How long will it take to save \$10,000? (Answer in years and months)
- You ran up a bill of \$1400 on your credit card. The interest rate is 17% computed monthly. You can afford to pay \$100 per month. How long will it take you to pay off your debt? (Answer in years and months)

Note on answering in years and months (to the nearest month): If you are dealing with monthly payments, compounding, or deposits and you solve for " y " in the formula, the number will be in years. If you want the answer to the nearest month you must convert the decimal part to months.

Example: Suppose you have an initial deposit and you are asked to calculate how long it will take before your deposit will reach some value (monthly compounding). You solve and find that $y = 12.357$.

So you have 12.357 years, but what is the answer in years and months?

$$(0.357 \text{ years})\left(\frac{12 \text{ months}}{1 \text{ year}}\right) = 4.284 \text{ months}$$

So the answer is 12 years and 4.284 months. Since we are dealing with monthly compounding 12 years and 4 months is not long enough, so it will take 12 years and 5 months before your money reaches the value you want.