***Calculation Example: Solving for Time - Logarithms***

**Question**: You have some money in the bank. The effective monthly interest rate is 0.5% per month. How long will it take before your money in the bank has doubled?

**Answer**: Let be the money currently in the bank. Therefore the money in the bank will double when the future value equals . The effective monthly rate is 0.5% which is 0.005.

monthsyears.

**Question**: You want to borrow $500,000 now to buy a house. You can afford to pay $4,000 per month towards the mortgage. The interest rate on the mortgage is 9% pa, given as an annualised percentage rate compounding per month. Therefore the effective monthly rate is 0.75% per month (=0.09/12). How long will it take you to pay it off?

**Answer**: The mortgage is fully amortising since the payments must completely pay off the loan at maturity. So,

, and using log rules,

months years