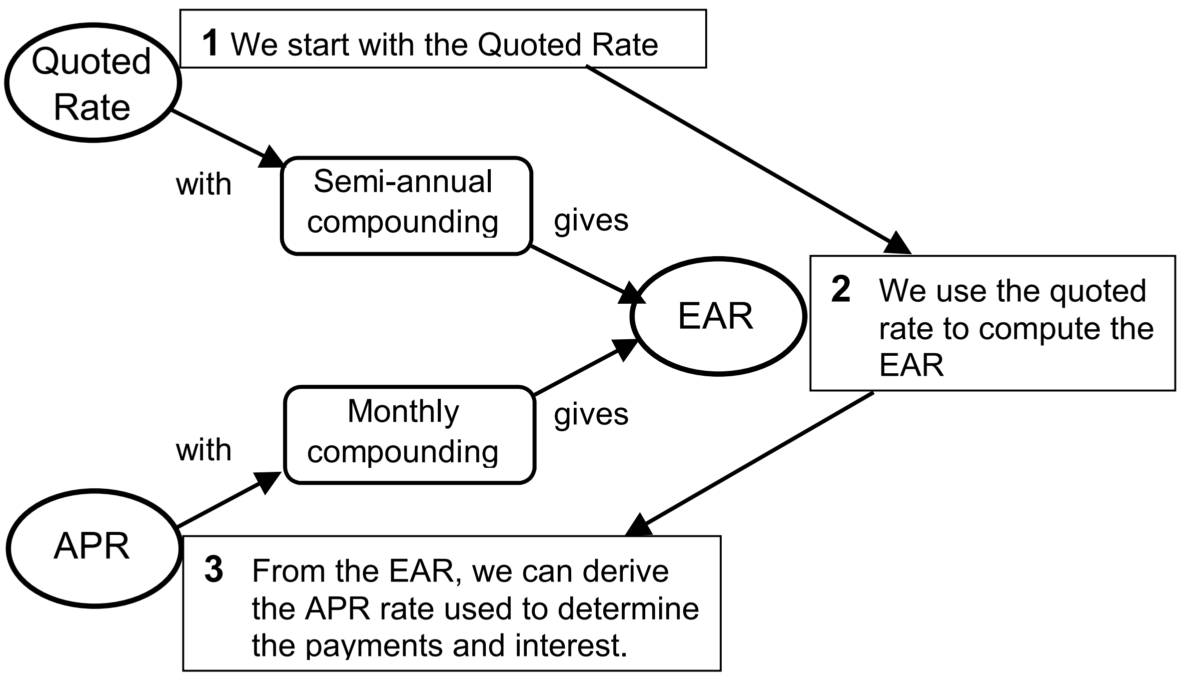
Quoted Rate vs. EAR vs. APR

When the compounding frequency corresponds with the payment frequency, we can also deal with things very easily. We see this in al the car loan and lease questions: When the compounding is monthly and the payments are monthly, we simply use 1/12th of the APR rate with each (monthly) interest period. In most cases and in most of these questions, you have not been asked to determine the EAR, although you should be able to.

When we have a problem is when the compounding frequency and the payment frequency are different. In the mortgage questions, we have this problem due to the regulation of mortgage interest calculations: The law says the lender can only compound semi-annually, whereas most of us pay our mortgages monthly. Therefore, by law, the EAR of the mortgage is the quoted rate compounded semi-annually. Necessity dictates that we need to use a rate that, when compounded monthly, has the same EAR to comply with the law. Schematically, this looks like this:



To compute the APR, we need to determine the EAR first and then work back to the APR. One-twelfth of the APR will be our monthly rate.