Example: How much house can I afford? (Fixed amount for Property Tax and Insurance)

You have a 50,000 annual income, and make car payments of 450 per month but have no other debt, and have $30,000 in the bank. How much house can you afford, given the following mortgage opportunity:

FRM conventional 30 year at 7.875%, requires 20% down with 28/36 qualifying ratios. Two discount points will be charges and closing cost and pro-rates =$3000. Property taxes will be 3600 per year and insurance 360 per year.

***Step 1*. How much of loan do I qualify for? This depends on the PITI I am allowed**

	28%	36%
Monthly income*ratio (50000/12*ratio)	1166.67	1500
Less other debts		450
Choose Min. as available for PITI	1166.67	1050

Available for PITI =	1050
Less property taxes	- 300
Less insurance	- 30
Available for debt service (PI)	720

Max amount of loan you can service (use financial calculator or formula) = $99,300.84

***Step 2*: Compute maximum size of loan you can afford to close on.**

Savings =	30000
Other closing	3000
Funds available for points and down payment.	27000

Define the following notation: HV = house value LV = loan value
For a 20% down payment loan note that 0.8*HV=LV or we can rewrite as
HV = 1.25*LV
In general for a down payment percent of "d" we can write (1-d)*HV = LV, or
HV = [1/(1-d)]*LV

We will allocate our available cash to either the down payment or the points so we can write:
Cash = Down payment + loan point fee

We know the Down payment depends on the HV and loan point fee on fee on the LV so we write:
Cash = d*HV + p*LV where p = points, expressed as a fraction of loan

We know the amount of cash we have, d, & p. We also know that HV=[1/(1-d)*LV) so we can write

Cash = d*[1/(1-d)]*LV + p*LV

or, solving for what we want to know, the LV we have:

LV = Cash/[(d/(1-d) + p]

For d=0.2 (i.e. 20% down payment) and p=0.02 (i.e. 2 points) and cash=27000 we have:
LV=27000/[.2/(1-.2) + .02] = 27000/.27 = 100000
This is maximum size loan that we have funds to close on.

We need to choose the lower of the two possible loan amounts; thus, the maximum size loan we can afford is $99,300. What is the maximum house we can afford? (Note that we don't need all of our cash to close this smaller loan, so we can use the extra money for a higher down payment (i.e. we are allowed more than 20% down, we are just not allow less) so we can apply that to buying the house. What remains is to compute the amount of house.
Max house = Loan amount + cash – prepays – points =
= 99300.84 + 30000 – 3000 – 1986.02 = $124,314.82