Fin4713: 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 $30000 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 ratio. 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**

<table>
<thead>
<tr>
<th>Monthly income*ratio</th>
<th>28%</th>
<th>36%</th>
</tr>
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<tbody>
<tr>
<td>(50000/12*ratio)</td>
<td>1166.67</td>
<td>1500</td>
</tr>
</tbody>
</table>

Less other debts

| 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.**

<table>
<thead>
<tr>
<th>Savings</th>
<th>30000</th>
</tr>
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<tbody>
<tr>
<td>Other closing</td>
<td>3000</td>
</tr>
<tr>
<td>Funds available for points and down payment</td>
<td>27000</td>
</tr>
</tbody>
</table>

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] = 27000/2.7 = 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 – prepaids – points =

= 99300.84 + 30000 – 3000 – 1986.02 = $124,314.82