**Investigating Loans & Mortgages – Assignment /68**

**Instructions**:

* Answer each question in the space provided. **Type your answers directly in** the space provided.
* You are encouraged to use a **TVM Solver** for the entire assignment. Here is a good one: <http://www.fncalculator.com/financialcalculator?type=tvmCalculator>
* **Email your completed assignment** to Josh\_Elliott@bwdsb.on.ca
* The assignment is due on **Monday June 15th by 9AM** (you may hand it in earlier)

**PART A – Purchasing a Vehicle**

You have decided to purchase a **used vehicle**.

1. Start by finding a **used vehicle that costs anywhere between $10 000 - $20 000.** You can use [www.autotrader.ca](http://www.autotrader.ca) and find any vehicle in Ontario. Give the details below. **[5 marks]**

|  |  |
| --- | --- |
| **Vehicle Make and Model:** | **Price**:  |
| **Year:** | **Colour:** |
| **Mileage (km):**  | **Location (where the vehicle is being sold):**  |

1. There is 13% sales tax on used vehicles in Ontario. Calculate the sales tax and total cost of the vehicle with tax. **Include calculations**. **[2 marks]**

**Sales tax:**

**Total cost with tax:**

1. You will borrow money to purchase this vehicle. For now assume you will borrow the entire amount (including the tax). Suppose you decide to settle on a **5 year loan.** You will make monthly payments, starting one month after you purchase the vehicle. Complete the table below to see how interest rates affect your final monthly payment. **[10 marks]**

|  |  |  |
| --- | --- | --- |
| **Interest Rate****(compounded monthly)** | **Monthly Payment Amount (Use a TVM Solver)** | **Total Interest Paid (show calculations)** |
| **4%** |  |  |
| **8%** |  |  |
| **9%** |  |  |
| **30%****(you left some bills in your name unpaid and thus have a poor credit score)** |  |  |

**Does doubling the interest rate (from 4% to 8%) double your payments?**

**Does doubling the interest rate (from 4% to 8%) double the total interest paid?**

1. Suppose you negotiate a loan from a bank at **8%/a compounded monthly.** You will make monthly payments. Complete the table below to show how changing the length of the loan affects the payment amount and total interest. **[8 marks]**

|  |  |  |
| --- | --- | --- |
| **Length of Loan** | **Monthly Payment Amount (Use a TVM Solver)** | **Total Interest Paid (show calculations)** |
| **4 years** |  |  |
| **5 years** |  |  |
| **6 years** |  |  |

**In total, how much would you save by taking 4 years to pay off the loan compared to 6 years?**

1. Sometimes when you purchase a vehicle a down payment is made. A down payment is an initial sum of money used to purchase the vehicle (before borrowing the rest).

**Suppose you select a 5 year loan, at 8%/a compounded monthly. In total, how much interest do you save by making a $2000 down payment? [4 marks]**

1. List four other costs associated with owning a vehicle (besides the car/loan payments). You may or may not need to research these costs. **[4 marks]**

**PART B – Purchasing a Home**

In this part of the assignment you will look at purchasing a home. To purchase a home you must first make a down payment (at a minimum of 5% of the purchase price of the home). You pay this amount up front and borrow (mortgage) the remaining.

A good website for finding homes is at: <https://www.realtor.ca/>

1. **Find 3 different homes (not empty properties/lots) that fall within the price ranges below.**
* Provide information about each home and calculate the monthly mortgage payment amount.
* **Suppose your mortgage is for 25 years at 3.5%, and you make monthly payments.**
* **You will make a 5% down payment and “mortgage” (borrow) the rest.**
* Your homes should be anywhere in Bruce or Grey Counties.
* (Notice how much more expensive Saugeen Shores is compared to the most of Grey/Bruce).

**[15 marks]**

**Price Range $250 00 - $300 000**

**Location of Home You Found (exact address if possible):**

**Price of Home You Found:**

**Brief Description of Home (number of bedrooms, size, etc.):**

**Picture of Home (bonus):**

**Down Payment Amount:**

**Mortgage Amount (what you need to borrow):**

**Monthly Payment Amount (use TVM Solver):**

**Price Range anything over $400 000**

**Location of Home You Found (exact address if possible):**

**Price of Home You Found:**

**Brief Description of Home (number of bedrooms, size, etc.):**

**Picture of Home (bonus):**

**Down Payment Amount:**

**Mortgage Amount (what you need to borrow):**

**Monthly Payment Amount (use TVM Solver):**

**Price Range $325 00 - $400 000**

**Location of Home You Found (exact address if possible):**

**Price of Home You Found:**

**Brief Description of Home (number of bedrooms, size, etc.):**

**Picture of Home (bonus):**

**Down Payment Amount:**

**Mortgage Amount (what you need to borrow):**

**Monthly Payment Amount (use TVM Solver):**

1. So how much should a person spend on a home? Banks use what is called a G**ross Debt Service Ratio (GDS ratio)** to calculate how much you can afford.

Your GDS ratio can be calculated by $GDS=\frac{monthly housing costs}{monthly income before tax}$.

Monthly housing costs include mortgage payments, property tax and heating costs.

Your GDS Ratio should be less than 0.35 (or 35%). This is another way of saying that your housing costs shouldn’t be more than 35% of your income.

For this question consider a family whose annual income is $100 000. They also have 2 children. **[20 marks]**

1. Calculate their monthly income.
2. What is the maximum amount the family should spend on monthly housing costs? (HINT: just multiply answer in part a) by 0.35).
3. Housing costs include heating and property taxes. Let’s assume property taxes are $350 per month and heating averages out to $100 a month. Subtract these amounts from part b) to find the **maximum amount they can spend on monthly mortgage payments.**
4. Use a TVM solver and your answer to part c) to calculate the maximum mortgage amount this family can afford. Note this represents the most money the couple should consider borrowing. It does not mean necessarily mean they should spend this much!

Assume the mortgage is for 25 years, at an interest rate of 3.5%/a compounded monthly, with monthly payments.

1. Now find a suitable home for the family. (Anywhere in Ontario). Note that the family must still come up with a 5% down payment for the home (often this fact is what limits how much a person can afford to pay for a home).

**Location of Home You Found (exact address if possible):**

**Price of Home You Found:**

**Brief Description of Home (number of bedrooms, size, etc.):**

**Picture of Home (bonus):**

**Down Payment Amount:**

**Mortgage Amount (what they need to borrow):**

**Monthly Payment Amount (use TVM Solver):**

**Total Interest Paid on Mortgage (over 25 years):**

1. Suppose that instead of making monthly payments, the family makes bi-weekly payments (every other week). If everything else about the mortgage is the same calculate their bi-weekly payment amount.
2. Why might a person rather make bi-weekly payments instead of monthly payments?