Everyone Wants a Mortgage

(for a home near the ocean!!)

Mortgage Scenario One

House cost:	$1 290 000
Deposit:	$150 000
Minimum Deposit:	10%

1)a) Do you have enough money for the deposit?

b) What is the largest percentage deposit could you make?

2) You decide to pay a deposit of 11% and use the rest of the money to buy some new furniture.

a) What is the size of your deposit?

b) How much money do you have to spend on furniture?

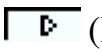
c) What is the size of your mortgage? (How much money is Easy-Money Bank lending you?)

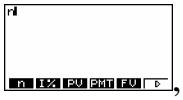
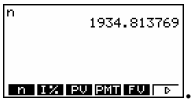
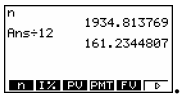
Loan:	$1 148 100
Interest rate:	7.1%

3)a) Find the minimum value for PMT. ie Find the smallest PMT value that will generate an 'n' value rather than an error message.

b) By following the instructions below convert your answer from 3a) into years.

Instructions for Q3b:

Enter RUN mode. Press VARS  ,  (F6) Press TVM (F4)

then n (F1)  , then EXE  . Then ÷ 12, EXE  .

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4) a) Use run mode to calculate the amount of interest generated in the first month.

b) Explain why a payment of $5000 generates an error message on the calculator.

5) Use TVM to calculate the size of your repayments if you are to pay the loan off in 20 years.

You realize that you cannot afford the repayments over 20 years.
6) Use TVM to calculate the size of your repayments if you are to pay the loan off in 30 years. How old will you both be in 30 years time?

You realize you will not be able to afford the repayments over 30 years.
7) Use TVM to calculate the size of your repayments if you are to pay the loan off in 40 years. How old will you both be in 40 years time?

8) The maximum duration that Easy-Money Bank will allow is 40 years. You decide to make monthly payments of $7300.

a) How many months will it take you to pay off the loan?

b) Use the instructions given for Q3b to calculate the duration of the loan in years.

How much of each $7300 payment actually reduces the loan and how much of each $7300 is paid to the bank as interest?

9) Return to the TVM screen, follow the teacher's instructions and investigate the following using the amortization function. When tracing the graph what do the numbers mean?

10) Consider the first payment of $7300. How much interest do you pay in the first month and by how much is your loan reduced in that month?

11) Consider n = 18 (the 18^{th} payment of $7300). How much interest do you pay in the 18^{th} month and by how much is your loan reduced in that month?

12) Consider the first payment after paying off the loan for 10 years. How much of your $7300 payment is interest and by how much is your loan reduced?

13) In which month is the principal first reduced by a greater amount than the amount of interest paid in that month? How many years is this?

14) Using RUN mode (and recalling TVM values when necessary) calculate

a) The total amount you have spent paying off your loan.

b) The total amount you paid for your $1 300 000 home (not including 40 years worth of repairs and renovations)

c) The total amount of interest you have paid.

d) Calculate the interest paid as a percentage of the original loan.

15) OPTIONAL INVESTIGATION: By constructing a budget calculate an approximate combined gross income you and your spouse will require in order to repay the loan, maintain a car or two, feed your family, entertain, travel and generally have a nice life.

Mortgage Scenario Two

Consider the following mortgage scenario:

- Home value = $650 000
- Deposit = 20%
- Interest = 7.2%
- Duration of loan = 25 years
- Compounding period = monthly

16) a) Calculate the size of the mortgage

b) Calculate the size of the repayments

c) In which month is the principal first reduced by a greater amount than the amount paying off interest? (Refer to the steps outlined for Q9)

d) Calculate the total cost of the house

e) Calculate the total interest paid

f) Calculate the total interest as a percentage of the loan amount

Thinking 'outside the box' in regard to owning a home

Let's reconsider Mortgage Scenario One. What if you investigated the possibility of renting for 40 years instead of paying off a mortgage. What if you were to pay rent but invest the difference between $7300 (the monthly cost of the mortgage in Scenario One) and the cost of renting.

Assume the cost of renting a house equivalent to the one you bought in Scenario One is $6000 per calendar month (roughly $1500 per week).
Assume the average interest rate you obtain on your long term investment (annuity) is 12%

17) How much money will you invest monthly in your annuity?

18) What will be the Future Value of your investment after 452 months (the duration of the mortgage in Scenario One)

19) What if the average cost of renting was $7000 a calendar month, meaning you could only invest $300 per month. What would be the size of your investment after 452 months?

20) What if you 'downsized' and decided to rent a less extravagant house. Let's say you rented a house for $4000 per calendar month. If you invested the difference as in Q18 what would be the value of your investment after 452 months?

21) What are some disadvantages of renting rather than owning?

22) What are some advantages of renting rather than owning?