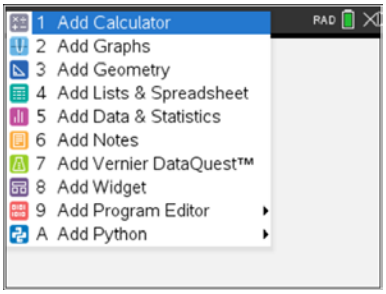
Example – Home Loan

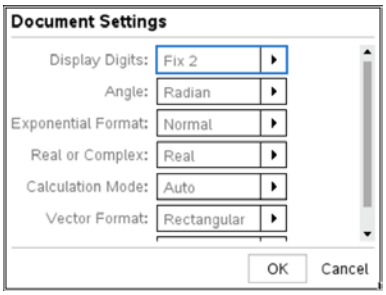
You purchase a home for $250,000, pay 20% down, and have a 30-year mortgage for the balance. What is the monthly payment if the interest rate for the loan is 7.9%?

Graph the loan balance over the life of the loan.

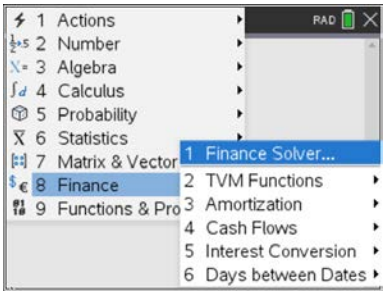
1. Press [on], and select **New** to start a new document. Select **Add Calculator**.



Note: To round computations to two decimal places, change the Display Digits setting in the Documents Settings to **Fix 2**. Press [enter] or click **OK**.



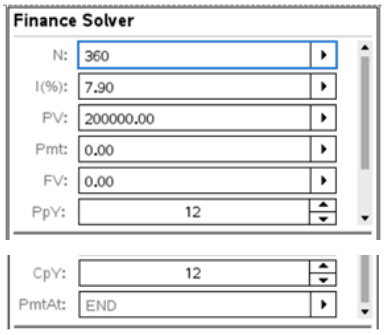
2. Press **Menu > Finance**. Select **Finance Solver**.



3. Enter the values as shown. To move from row to row in the Finance Solver, press [tab].

   For PV, enter either 250000 [−] 0.2 [×] 250000 or 200000. This represents the amount of the loan, $250,000, minus the 20% down payment.

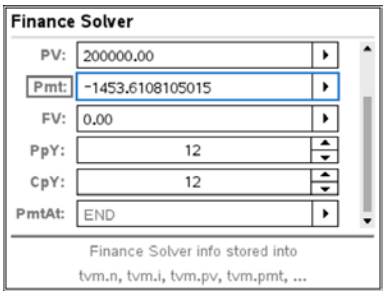
   Note that N is 360 because there are 12 payments per year for 30 years. PV is entered as a positive number because the $200,000 was received from the finance company.



4. Place the cursor in the Pmt row. Press [enter] to calculate the payment.

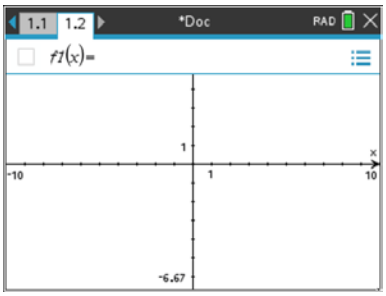
   The payment, -1453.61, is negative because that is the amount paid to the finance company each month.

   Note: Tab to another row to display the payment rounded to two decimal places.

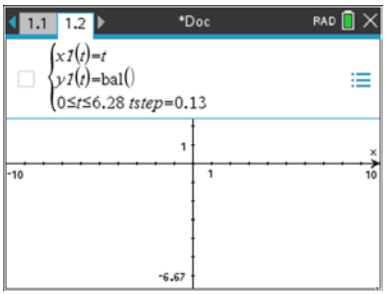


5. Press [esc] to exit the Finance Solver.

6. To graph the outstanding loan balance after each monthly payment, first add a Graphs page by pressing [ctrl] [doc▾] and selecting **Add Graphs**.



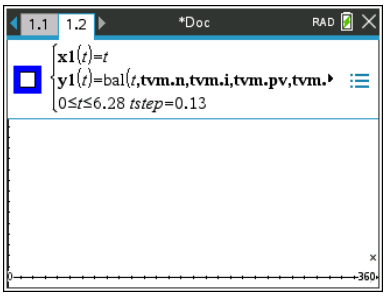
7. Select the Parametric graphing mode by pressing **Menu > Graph Entry/Edit > Parametric**.
8. Type the letter **t** to define x1(t) as t.
9. Arrow or tab down to y1(t). To define y1(t) as the balance, first select **bal(** from the catalog ([📖]) or type **bal(**.



10. The syntax is **bal**(NPmt, N, I, PV, [Pmt], [FV], [PpY], [CpY], [PmtAt], [roundValue]).

    Enter **t** for NPmt and then press [,].

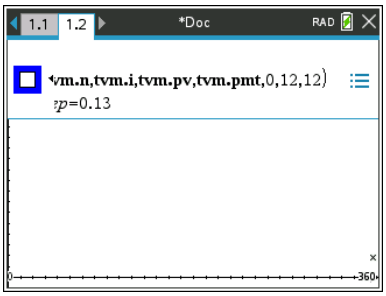
    Note: Values that were entered or computed in the Finance Solver are stored as variables and may be accessed by pressing [var].



    Enter the additional values using the [var] menu or type the values, as shown for FV (0), PpY (12), and CpY (12).

    Enter a comma between each entry.

    Note: The default for PmtAt is END. The optional roundValue wasn't entered.

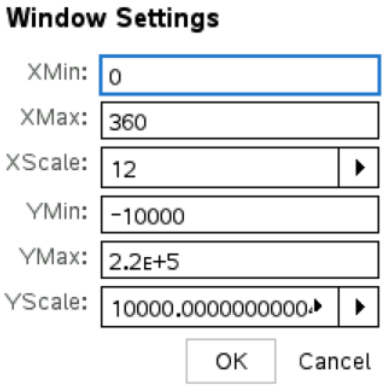


11. Arrow or tab down to the next row. Change the maximum *t* value to 360 and the *tstep* to 12.

12. Press enter to graph.

13. To view the graph, change the viewing window.

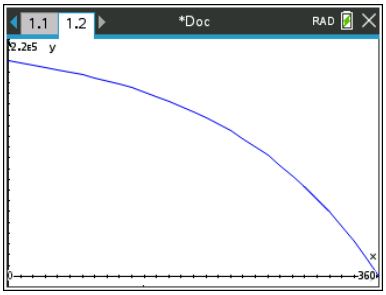
    Press **Menu > Window/Zoom > Window Settings**, and enter appropriate values for the loan data. Possible values are shown at the right.



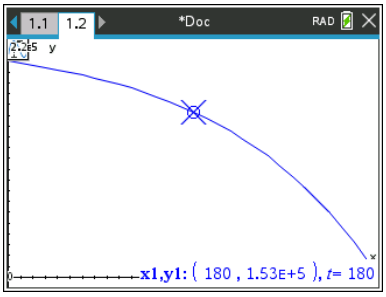
    Note: 220000 was entered for YMax and 10000 was entered for YScale.

    After entering values, press enter or select **OK**.

    Note: If the parametric equation label is displayed, move to the label, press ctrl menu, and select **Hide**.



14. Press **Menu > Trace > Graph Trace.** To display the balance for a particular time t, enter a value between the minimum and maximum t values, inclusive, while in Graph Trace mode. Then, press enter.



    Note: The number of digits displayed are controlled by the Graphs & Geometry Settings. To display more digits, select **Menu > Settings**.