

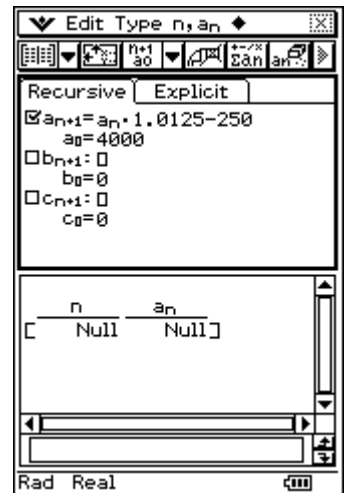
Open the Sequence application.

Tap **Edit, Clear All, OK**.


*Suppose a student wishes to purchase a car priced at \$4000. The student has no savings but due to a part-time job can afford to repay \$250 every month. A bank offers the student a loan of \$4000 at a monthly interest rate of 1.25% compounded monthly. How many complete months will it take the student to repay the loan and how much interest will be paid in total?*

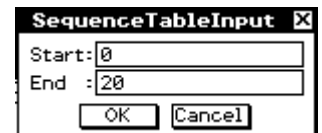
We will use the recursive formula  $T_{n+1} = T_n \times 1.0125 - 250$ ,  $T_0 = 4000$  to solve this problem.

Enter the formula as shown.




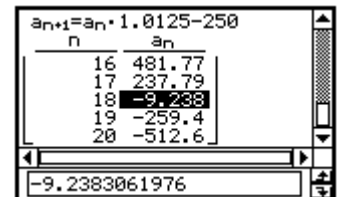
Without interest, the loan will take  $4000 \div 250 = 16$  months to repay, so we will need to allow for a few more, say 20, iterations of the formula.

Tap .



Use Start and End to set the first term as **0** and last term as **20** and then tap **OK**.

Tap .



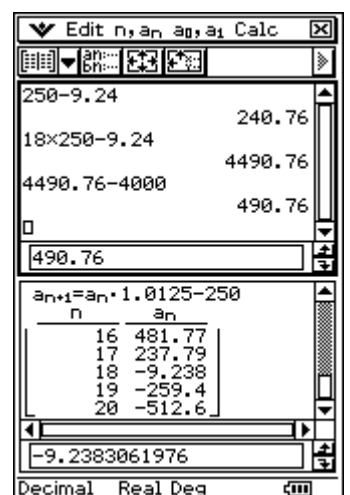
Scroll to the bottom of the table.

The loan is repaid after 18 repayments.

We will now need to carry out a few manual calculations.

Tap  to open the Sequence RUN window.

As the figure in the 18th row and 2nd column is -9.24, we can deduce that the final payment was \$9.24 too much - it should have been \$240.76.



The total repaid was 18 payments of \$250 less \$9.24, which comes to \$4490.76.

The total interest paid is \$490.76 - the total repaid less \$4000, the amount of the original loan.

It is also possible to determine the amount of interest paid in any particular month - say the 12th month.

Close the RUN window using  $\square$ .

Tap the drop-down arrow next to  $\square$ .

Tap  $\square$ .

$a_{n+1} = a_n \cdot 1.0125 - 250$   
 $a_0 = 4000$   
 $b/a$   
 $a_1 = 0$   
 $b_0 = 0$   
 $c =$   
 $a+b$   
 $c_0 = 0$

n	$a_n$
16	481.77
17	237.79
18	-9.238
19	-259.4
20	-512.6

-9.2383061976

Deg Real

Tap **Resize**.

An third column has been added to the table headed Dfrn (the difference of consecutive terms).

Note the difference of \$229.28 for the 12th month.

$a_{n+1} = a_n \cdot 1.0125 - 250$   
 $a_0 = 4000$

n	$a_n$	Dfrn
0	4000	undefined
1	3800	-200
2	3597.5	-202.5
3	3392.5	-205.0
4	3184.9	-207.6
5	2974.7	-210.2
6	2761.9	-212.8
7	2546.4	-215.5
8	2328.2	-218.2
9	2107.3	-220.9
10	1883.7	-223.7
11	1657.2	-226.5
12	1427.9	-229.28
13	1195.8	-232.2
14	960.72	-235.1

-229.284843007

Deg Real

Without interest, the loan should reduce each month by the regular repayment of \$250.

The reduction of only \$229.28 is due to the interest added.

Tap  $\square$  to again open the Sequence RUN window.

The interest for the 12th month was \$20.72.

$18 \times 250 - 9.24$   
 $4490.76 - 4000$   
 $250 - 229.28$   
 $0$   
 $20.72$

n	$a_n$	Dfrn
0	4000	undefined
1	3800	-200
2	3597.5	-202.5
3	3392.5	-205.0
4	3184.9	-207.6

Decimal Real Deg