

## 41. My New Car (FM)

(KP:2.1,4.1;5.3;7.1;8.1;9.1;9.3;9.5;12.1)

I was really keen to buy a new Ozmobile and when I went to Oz-Motors, they agreed to a price of \$32,000 with no down payment. They were able to offer a loan for the full amount with an interest rate of 10% per year. I hoped to pay off the loan in 5 years with monthly payments.



1. Would payments of \$450 per month pay off the loan in 5 years? If not, how much is still owed?
2. Repeat question 1 for a payment of \$500 per month.
3. Try three other payments as in questions 1 and 2.
4. Record the 5 payment amounts in the questions above in List 1 and the corresponding amounts still owed in List 2. Draw a scatter plot showing the amount still owed as a function of the payment per month.
5. Determine the equation for the amount still owed after 5 years as a function of the payment per month. Hence determine the payment needed to pay off the loan in 5 years.
6. Suppose \$575 per month was the most I could afford.
  - (a) How long would it take to pay off the loan?
  - (b) What size loan can I really afford if I want to pay it off over 5 years (at \$575 per month)?

**Note:** This task involves a first principles approach to paying off a loan. Features include the use of recurrence relations using the sequence mode, list variables, and using a linear model for predictive purposes.