Nik's car loan

1. When Nik bought his gold station wagon the agreed price was $3500. He paid a $500 deposit and had to borrow the remaining $3000. Nik compared loans and chose a loan from a credit union. The interest rate was 12% and Nik agreed to make monthly payments over 2 years.

a) How many monthly payments does Nik have to make over the loan?

To work out what Nik's monthly repayments would be, we can use the following formula (present value formula for an annuity):

$$N = M\left(\frac{(1+r)^n - 1}{r(1+r)^n}\right)$$

M = repayment amount
N = the amount borrowed
r = the interest rate per payment (per month)
n = the number of repayments

So, using the details of Nik's loan:

N (the amount borrowed) = 3000
r (interest rate) = 12% pa = 0·12 pa = 0·01 per month
n (number of repayments) = 24

$$3000 = M\left(\frac{(1\cdot01)^{24} - 1}{0\cdot01(1\cdot01)^{24}}\right)$$

$$3000 = M\left(\frac{0\cdot2697336}{0\cdot0126973}\right)$$

$$3000 = M \times 21\cdot243382$$

$$M = \frac{3000}{21\cdot243382}$$

$$M = 141\cdot22$$

b) What would be the total amount paid for the car over the term of the loan? (Mn) ---

c) What is the total interest Nik would pay on the loan? (Mn–N) ---

2. Now use the same formula to determine the repayment amount (M) when a person borrows $2000 and repays it by 4 equal monthly instalments. The interest rate is 24% reducible, calculated on monthly balances.