Exercise 11.4

1. Using the formula $M = \dfrac{PR^n(R-1)}{R^n - 1}$ calculate the monthly repayment for the following loans

a) loan = $3000, $r = 12\%$, $n = 2$ years

b) loan = $1200, $r = 9\%$, $n = 3$ years

c) loan = $5000, $r = 18\%$, $n = 18$ months

d) loan = $25000, $r = 8\%$, $n = 20$ years

2. A man borrows $12000 from a bank charging 15% p.a. reducible interest. If he agrees to repay it in 60 equal monthly repayments, how much must he meet each month ?

3. A lady bought a second-hand car for $8000 on hire purchase.

a) If the financial company charges 12% p.a. and she agrees to pay it off in 3 years, how much is each monthly repayment ?

b) If she pays a deposit of 20% and pays off the balance in 12 months at 10% p.a., how much is each

      i) monthly repayment ?   ii) quarterly payment ?

4. A couple bought a house 5 years ago and borrowed $80000 at 15% p.a.

a) If the loan is to be paid off in 20 years show that they must pay $1053.43 per month.

b) Show that their outstanding loan can be calculated from

$$80000 \times 1.0125^{60} - 1053.43(1 + 1.0125 + 1.0125^2 + \ldots + 1.0125^{59})$$

hence, calculate their outstanding loan.

5. A family borrows $100000 to buy a house. Interest is charged at 12% p.a. and the loan is to be paid off by equal monthly repayments over 20 years.

a) Show that each repayment is $1101.10

b) How much is the total interest ? Calculate the equivalent simple interest rate.

c) Find the unpaid balance after repayments have been made in

      i) 5 years   ii) 10 years   iii) 15 years

6. Friendly building society allows its customers to repay their loans at their convenience. A family decides to repay its $100000 loan by making fortnightly repayments of $550.55, instead of $1101.10 monthly. Assume interest is charged at 12% p.a. as in question 5.

a) When will they pay off their loan ?

b) How much is the total interest ? Calculate the equivalent simple interest rate.

c) Compare with question 5, how much is their saving on the interest ?

7. A father sets up a sinking fund that will pay $2000 per year to his new-born son when he reaches 15 years old for six years.

a) How much must he deposit now if the bank guarantees 10% p.a. interest, compounding yearly

b) If he cannot afford the amount in (a) and wants to spread it out for four years. How much is the amount of each of his annual deposits ?

^{S}8. A farmer bought a block of land for $50000. He borrowed the money from a bank which charges him 8% p.a. compounding monthly.

a) If the farmer can pay off the loan with 12 equal quarterly repayments, calculate the amount of each repayment.

b) Calculate the amount of each repayment if he can pay off the loan with 6 semi-annual repayments.

9. Crazy Bargain Discount offers its customers "nothing to pay for twelve months ". John has just bought a lounge suite costing $1800 and agrees to pay off the loan with a 12 equal repayments, the first one is due in twelve months .

a) Calculate the amount of each of his repayments if interest is calculated at 9% p.a. reducible.

b) If John decides not to waive for twelve months, but pays the same repayment amount as in part (a) starting one month later, how much sooner will he pay off the loan ?

^{S}10. Alex borrows $6000 at 9% p.a. from a bank. The money is to be repaid by equal monthly repayments over three