



Goals

Table 1. Even Principal Payment Schedule

(\$10,000 loan, 7% annual interest, 20 annual payments)

Year	Total Payment	Principal	Interest ^v	Unpaid Balance
0				\$ 10,000
1	\$ 1,200	\$ 500	\$ 700	\$ 9,500
2	\$ 1,165	\$ 500	\$ 665	\$ 9,000
3	\$ 1,130	\$ 500	\$ 630	\$ 8,500
4	\$ 1,095	\$ 500	\$ 595	\$ 8,000
5	\$ 1,060	\$ 500	\$ 560	\$ 7,500
6	\$ 1,025	\$ 500	\$ 525	\$ 7,000
7	\$ 990	\$ 500	\$ 490	\$ 6,500
8	\$ 955	\$ 500	\$ 455	\$ 6,000
9	\$ 920	\$ 500	\$ 420	\$ 5,500
10	\$ 885	\$ 500	\$ 385	\$ 5,000
11	\$ 850	\$ 500	\$ 350	\$ 4,500
12	\$ 815	\$ 500	\$ 315	\$ 4,000
13	\$ 780	\$ 500	\$ 280	\$ 3,500
14	\$ 745	\$ 500	\$ 245	\$ 3,000
15	\$ 710	\$ 500	\$ 210	\$ 2,500
16	\$ 675	\$ 500	\$ 175	\$ 2,000
17	\$ 640	\$ 500	\$ 140	\$ 1,500
18	\$ 605	\$ 500	\$ 105	\$ 1,000
19	\$ 570	\$ 500	\$ 70	\$ 500
20	\$ 535	\$ 500	\$ 35	\$ 0
Total	\$ 17,350	\$ 10,000	\$ 7,350	

^v interest = unpaid balance times 7 percent.

This week:

- use a recurrence relation to model a compound interest loan or investment, and investigate (numerically or graphically) the effect of the interest rate and the number of compounding periods on the future value of the loan or investment
- use a recurrence relation to model a reducing balance loan and investigate (numerically or graphically) the effect of the interest rate and repayment amount on the time taken to repay the loan
- with the aid of a financial calculator or computer-based financial software, solve problems involving reducing balance loans; for example, determining the monthly repayments required to pay off a housing loan
- use a recurrence relation to model an annuity, and investigate (numerically or graphically) the effect of the amount invested, the interest rate, and the payment amount on the duration of the annuity
- with the aid of a financial calculator or computer-based financial software, solve problems involving annuities (including perpetuities as a special case); for example, determining the amount to be invested in an annuity to provide a regular monthly income of a certain amount

Theoretical Components

Resources:

For this week the theory work is in the *PDF file*:
Week 4 and 5 Notes & Exercises

Knowledge Checklist

- Concept of compounding
- Reducing balance
- Term of investment or loan
- Interest rate per period
- Repayment schedule
- Balance after repayment
- Discharge of loan
- Annuity
- Principal
- Calculating growth factor
- Amount owing
- Debited
- Interest period

Practical Components

There are questions to be answered in the booklet *Week 4 and 5 Notes & Exercises*.

Excel files:

- Annuities and Repayments

Investigation

On HawkerMaths and attached to this week's work