Solution to Problem 1, Compound interest, (p.3). The basic relation is:

$$F = (1+i)^N P \tag{94}$$

In our case, $i = 0.12$, $N = 6$ and $P = 1,500$. Thus $F = \$2,960.73$.

Solution to Problem 2, Compound interest, (p.3). See table 4, which explains that:

$200 interest is paid each year for years 1–4.

$100 interest is paid each year for years 5–8.

$1,200 is the total interest paid.

Year	Amount owed at beginning of year	Interest accrued for year	Payment at end of year
1	2,000	200	200
2	2,000	200	200
3	2,000	200	200
4	2,000	200	1,200
5	1,000	100	100
6	1,000	100	100
7	1,000	100	100
8	1,000	100	1,100
Total:		1,200	3,200

Table 4: Solution to problem 2.

Solution to Problem 3, Compound interest, (p.3). We can immediately obtain the answer from the following relation:

$$F = (1+i)^N P = 1.1^8 \times 2000 = 4287.17 \tag{95}$$

However, it is interesting to compare the details of the result, in comparison to table 4 from problem 2. See table 5.

• 2nd column (amount owed at beginning of each year):
Compound interest on principal: row n = $1.1^{n-1}\times$ row 1.

• 3rd column (interest accrued for year):
3rd column = 0.1 $\times$ 2nd column.

• Thus the total interest paid is $2,287.17, which is much greater than in problem 2 because of (1) compounding (2) deferred repayment of all principal to year 8.

Year	Amount owed at beginning of year	Interest accrued for year	Payment at end of year
1	2,000	200	0
2	2,200	220	0
3	2,420	242	0
4	2,662	266.20	0
5	2,928.20	292.82	0
6	3,221.02	322.10	0
7	3,543.12	354.31	0
8	3,897.43	389.74	4,287.17
Total:		2,287.17	4,287.17

Table 5: Solution to problem 3.

Solution to Problem 4, Equivalent annual payment, (p.3). The basic relation is:

$$A = \frac{i(1+i)^N}{(1+i)^N - 1} P \tag{96}$$

In our case: $i = 0.1$, $N = 5$, $P = 20,000$. Thus:

$$A = 0.263797 \times 20,000 = \$5,275.95 \tag{97}$$

Solution to Problem 5, Compound interest, (p.3). See table 6.

- 2nd column (amount owed at beginning of each year):
  Remaining principal minus last year's payment of $4,000.
- 3rd column (interest accrued for year):
  3rd column = 0.1 $\times$ 2nd column.
- Thus the total interest paid is $6,000.
- The total payment in problem 4 is $5 \times 5,275.95 = \$26,379.75$. Thus the interest paid in problem 4 is $6,379.75.
- The interest paid in problem 4 is greater than in problem 5 because of repayment of principal during the loan in problem 5.

Year	Amount owed at beginning of year	Interest accrued for year	Payment at end of year
1	20,000	2,000	6,000
2	16,000	1,600	5,600
3	12,000	1,200	5,200
4	8,000	800	4,800
5	4,000	400	4,400
Total:		6,000	26,000

Table 6: Solution to problem 5.