

Practise, Apply, Solve 2.5, page 138

1. (a) \$600.00
(b) ordinary annuity: payments are made at the end of every 3 months
(c) Her periodic payment corresponds to the interest conversion period (both calculated quarterly).
(d) interest = \$131.40; new balance = \$7301.23
(e) Change cell B3 from 0 to 1500.
2. (a)

Period	Interest	New Balance
1	\$12	\$612
2	\$12.24	\$1224.24
3	\$24.48	\$1848.72
4	\$36.97	\$2485.69
5	\$49.71	\$3135.40
6	\$62.71	\$3798.11
7	\$75.96	\$4474.07
8	\$89.48	\$5163.55

 (b) annuity due
 (c) \$363.55
 (d) The interest cell C3 should be changed to “ = (B3 + D3) * 0.02” so interest is also earned on the payment.
 (e) Change cell C3 to = B3 * 0.005.
3. (a) one month
(b) This number is used because the interest rate is compounded monthly and there are 36 months in 3 years, resulting in 36 pay periods.
(c) \$68.09
(d) If the payment were reduced by \$0.01 to \$298.27, then the balance would be less than \$12 000. In order to have a balance of \$12 000, the payment would have to be rounded to a fraction of a penny, which is not possible.
(e) Change cell C3 to = B3 * 0.005.
4. (a) The difference in balances is attributed to the increase in the payments and to the interest earned on the increased payments.
(b) \$7.27
5. A good first guess might be $\$6500 \div 16$ or \$406.25. This guess could be increased to allow for interest payments to a guess of about \$450 or \$470.
6. (a) 4 years or 48 months
(b) 3 months (c) 16 payments (d) 2.5%
7. (a)

Pay. #	Amount Paid	Int. Paid	Princ. Paid	Out. Bal.
0				\$3600
1	\$625	\$198	\$427	\$3173
2	\$625	\$174.51	\$450.49	\$2722.51
7	\$625	\$36.23	\$588.77	\$70.02
8	\$625	\$3.85	\$621.15	-\$551.13

 (b) \$73.87
 (c) \$695.02
8.

Pay. #	Pay.	Int. Paid	Princ. Paid	Bal.
0				\$3600.00
1	\$625.00	\$198.00	\$427.00	\$3173.00
2	\$625.00	\$174.52	\$450.49	\$2722.52
7	\$625.00	\$36.23	\$588.77	\$70.04
8	\$625.00	\$3.85	\$621.15	-\$551.11

 (a)

Period	Prev. Bal.	Int. (5%/a)	Pay. Made	New Bal.
1	\$12 000.00	\$150.00	\$500	\$12 650.00
2	\$12 650.00	\$158.13	\$500	\$13 308.13
19	\$25 030.02	\$312.88	\$500	\$25 842.90
20	\$25 842.90	\$323.04	\$500	\$26 665.94

- (b) \$1128.14 (c) \$476.18
(d) Answers will vary. (e) Answers will vary.
10. (a) \$669.18
(b) \$221.82
(c) $(\$221.82 \times 3 = \$665.46)$ By making monthly payments the balance is reduced each month rather than every 3 months. This produces a slight reduction in interest charges and hence a reduction in payments. If payments are made more frequently the total interest paid is reduced.
11. (a) 1.5%
(b) and (c)

Pay. #	Pay.	Int. Paid	Princ. Paid	Bal.
0				\$1800.00
1	\$165.25	\$27.00	\$138.25	\$1661.75
2	\$165.25	\$24.93	\$140.32	\$1521.43
11	\$165.25	\$4.81	\$160.44	\$159.90
12	\$165.25	\$2.40	\$162.85	-\$2.95

 (d) nonlinear with points (payment, balance) at {(0, 1800), (1, 1661.75), (2, 1521.43), ... (12, -2.95)}
12. 22%
13. Bev always earns always greater interest than the interest and deposit Cindy makes, so Cindy will never catch up to Bev.
14. (a) \$27 046.45 (b) \$46 121.88
15. \$7211.82
16. Answers will vary.
17. (a) 14%/a compounded monthly
(b) \$732.68
(c) The advertised value is based on \$13 200 being borrowed because of the \$3000 down payment.
(d) His payments would be \$597.00 and he would save \$882.48.
- 18.(a)

Pay. #	Pay.	Int. Paid	Princ. Paid	Out. Bal.
0				\$48000.00
1	\$595.00	\$336.00	\$259.00	\$47741.00
2	\$595.00	\$334.19	\$260.81	\$47480.19
119	\$595.00	\$5.10	\$589.90	\$138.89
120	\$595.00	\$0.97	\$594.03	-\$455.14

 (b) 120 months (c) \$139.86
 (d) \$22 944.86
 (f) in 102 months or 18 months sooner
 (g) about \$5127.84
19. (a) \$1631.14
(b) \$1640.11. Interest is earned on the first payment and that interest in turn is compounded for 7 more months.
20. (a) By making monthly payments the principal is reduced each month, instead of every 3 months, thereby reducing the interest owed over each 3-month period. However, 12%/a compounded monthly is a greater interest charge than 12%/a compounded quarterly.
(b) Using a spreadsheet, it can be found that it will take 17 full quarterly payments of \$3000 and an additional payment of \$854.01. Total loan cost is \$51 854.01. It will take 51 full monthly payments of \$1000 and an additional payment of \$338.67. Total loan cost is \$51 338.67. She should make monthly payments, which will save her about \$515.34 in interest costs.
21. \$17 656.04