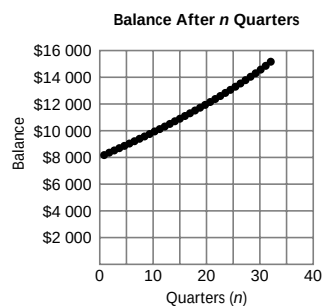


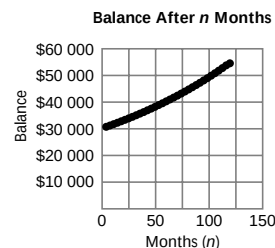
Period	Previous Balance	Interest At 8.0%/a	Quarterly Balance
1	\$8,000.00	\$160.00	\$8,160.00
2	\$8,160.00	\$163.20	\$8,323.20
3	\$8,323.20	\$166.46	\$8,489.66
4	\$8,489.66	\$169.79	\$8,659.46
5	\$8,659.46	\$173.19	\$8,832.65
6	\$8,832.65	\$176.65	\$9,009.30
7	\$9,009.30	\$180.19	\$9,189.49
8	\$9,189.49	\$183.79	\$9,373.28
9	\$9,373.28	\$187.47	\$9,560.74
10	\$9,560.74	\$191.21	\$9,751.96
11	\$9,751.96	\$195.04	\$9,946.99
12	\$9,946.99	\$198.94	\$10,145.93
13	\$10,145.93	\$202.92	\$10,348.85
14	\$10,348.85	\$206.98	\$10,555.83
15	\$10,555.83	\$211.12	\$10,766.95
16	\$10,766.95	\$215.34	\$10,982.29
17	\$10,982.29	\$219.65	\$11,201.93
18	\$11,201.93	\$224.04	\$11,425.97
19	\$11,425.97	\$228.52	\$11,654.49
20	\$11,654.49	\$233.09	\$11,887.58
21	\$11,887.58	\$237.75	\$12,125.33
22	\$12,125.33	\$242.51	\$12,367.84
23	\$12,367.84	\$247.36	\$12,615.19
24	\$12,615.19	\$252.30	\$12,867.50
25	\$12,867.50	\$257.35	\$13,124.85
26	\$13,124.85	\$262.50	\$13,387.34
27	\$13,387.34	\$267.75	\$13,655.09
28	\$13,655.09	\$273.10	\$13,928.19
29	\$13,928.19	\$278.56	\$14,206.76
30	\$14,206.76	\$284.14	\$14,490.89
31	\$14,490.89	\$289.82	\$14,780.71
32	\$14,780.71	\$295.61	\$15,076.32
		\$7,076.32	



(c) The total interest earned over the first 8 years for part (a) is \$737.14 as shown above and for part (b) is \$1373.27 as shown above.

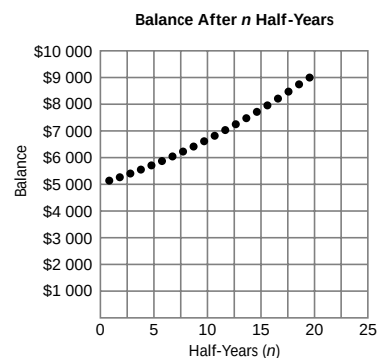
(d) Modify the spreadsheet as shown below.

	A	B	C	D
1	Period	Previous	Interest	Monthly
2		Balance	At 6.0%/a	Balance
3	1	30 000	=B3 * 0.005	=B3 + C3
4	=A3 + 1	=D3	=B4 * 0.005	=B4 + C4
				Balance After 10 years = \$54 581.90



(e) Modify the spreadsheet as shown below.

	A	B	C	D
1	Period	Previous	Interest	Semi-Annual
2		Balance	At 6.0%/a	Balance
3	1	5000	=B3 * 0.03	=B3 + C3
4	=A3 + 1	=D3	=B4 * 0.03	=B4 + C4
				Balance After 10 years = \$9030.56



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1. (a) Her periodic payment is \$600.
- (b) Her savings plan is an example of an ordinary annuity because the periodic payment is made at the end of every 3 months.
- (c) It is simple annuity because both the deposit and interest conversion periods are every 3 months.
- (d) Interest earned = $\$6569.83(0.02) = \$131.40$
New balance = $\$6569.83 + \$131.40 + \$600 = \$7301.23$
- (e) Change cell B3 from 0 to 1500.

2. (a)

Period	Interest(I)/New Balance(B)
1	$I = 600(0.02) = \$12.00$; $B = 0 + 12 + 600 = \$612.00$
2	$I = 612(0.02) = \$12.24$; $B = 612 + 12.24 + 600 = \$1224.24$
3	$I = 1224.24(0.02) = \$24.48$; $B = 1224.24 + 24.48 + 600 = \$1848.72$
4	$I = 1848.72(0.02) = \$36.97$; $B = 1848.72 + 36.97 + 600 = \$2485.69$
5	$I = 2485.69(0.02) = \$49.71$; $B = 2485.69 + 49.71 + 600 = \$3135.40$
6	$I = 3135.40(0.02) = \$62.71$; $B = 3135.40 + 62.71 + 600 = \$3798.11$
7	$I = 3798.11(0.02) = \$75.96$; $B = 3798.11 + 75.96 + 600 = \$4474.07$
8	$I = 4474.07(0.02) = \$89.48$; $B = 4474.07 + 89.48 + 600 = \$5163.55$

(b) This is annuity due because the payment is made at the beginning of every three months.

(c) To determine the interest earned over the two years, we add the eight interest values found in part (a).

The interest earned is:

$$\$12.00 + \$12.24 + \$24.48 + \$36.97 + \$49.71 + \$62.71 + \$75.96 + \$89.48 = \$363.55$$

(d) The interest cell, C3, should be changed to “= (B3 + D3)*0.02”, so the interest is also earned on the payment.

3. (a) The payment interval is one month.

(b) There are 36 payment intervals in this example because the interest rate is compounded monthly and there are 36 months in three years.

(c) Rodrigo earns \$68.09 in interest in the 34th payment interval.

(d) If the payment is reduced by \$0.01 to \$298.27, 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) We find the interest earned under both payment plans.

Interest Earned = Balance – Payments Made

With \$300 payments:

$$\text{Interest Earned} = \$12\,069.41 - \$300(36) = \$1269.41$$

With \$298.28 payments:

$$\text{Interest Earned} = \$12\,000.22 - \$298.28(36) = \$1262.14$$

Therefore, the difference in interest under both plans is

$$\$1269.41 - \$1262.14 = \$7.27.$$

5. Possible Solution: Phong borrows \$6500 at 10%/a and makes quarterly payments for four years. He must repay the \$6500 plus interest in 16 (4×4) payments. 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) The term of the annuity is 4 years or 48 months.

(b) The payment interval for the annuity is 3 months.

(c) You would make $48 \div 3 = 16$ payments altogether.

(d) The interest rate per payment interval is $10\% \div 4$ or 2.5%/quarter.

7. (a)

Pay #	Amt. Paid	Interest Paid(I)	Princ. Paid	Out. Bal.
0				\$3600.00
1	\$625	$\$3600 \times 0.055 = \$198$	\$427.00	\$3173.00
2	\$625	$\$3173 \times 0.055 = \$174.51$	\$450.49	\$2722.51
3	\$625	$\$2722.51 \times 0.055 = \$149.74$	\$475.26	\$2247.25
4	\$625	$\$2247.25 \times 0.055 = \$123.60$	\$501.40	\$1745.85
5	\$625	$\$1745.85 \times 0.055 = \$96.02$	\$528.98	\$1216.87
6	\$625	$\$1216.87 \times 0.055 = \$66.93$	\$558.07	\$658.79
7	\$625	$\$658.79 \times 0.055 = \$36.23$	\$588.77	\$70.02
8	\$625	$\$70.02 \times 0.055 = \$3.85$	\$621.15	–\$551.13

(b) If she takes a full four years to repay the loan, her last payment would be $\$70.02 + \$3.85 = \$73.87$.

(c) If she repays the loan in seven payments, her last payment would be $\$625 + \$70.02 = \$695.02$.

8. Adjust the spreadsheet cells as shown and use the fill down features to produce the amortization table shown.

The table values are all within two cents due to rounding.

	A	B	C	D	E
1	Pay.	Amount	Interest	Principal	Out.
2	#	Paid	Paid	Paid	Balance
3	0	-----	-----	-----	\$3,600
4	=A3+1	\$625	=E4*0.055	=B4–C4	=E3+C4–B4

Pay. #	Amount Paid	Interest Paid	Principal Paid	Outstanding Balance
0				\$3,600.00
1	\$625.00	\$198.00	\$427.00	\$3,173.00
2	\$625.00	\$174.52	\$450.49	\$2,722.52
3	\$625.00	\$149.74	\$475.26	\$2,247.25
4	\$625.00	\$123.60	\$501.40	\$1,745.85
5	\$625.00	\$96.02	\$528.98	\$1,216.87
6	\$625.00	\$66.93	\$558.07	\$658.80
7	\$625.00	\$36.23	\$588.77	\$70.04
8	\$625.00	\$3.85	\$621.15	–\$551.11

9. (a) Adjust the spreadsheet cells as shown and use the fill down features to produce the quarterly balances shown.

	A	B	C	D	E
1	Period	Prev.	Interest	Pay.	New
2		Bal.	At 5%/a	Made	Balance
3	1	\$12 000	=B3*0.0125	\$500	=B3+C3 + D3
4	=A3+1	=E3	=B4*0.0125	=D\$3	=B4+C4 + D4

Per.	Previous	Interest	Pay.	New
	Balance	At 5%/a	Made	Balance
1	\$12,000.00	\$150.00	\$500	\$12,650.00
2	\$12,650.00	\$158.13	\$500	\$13,308.13
3	\$13,308.13	\$166.35	\$500	\$13,974.48
4	\$13,974.48	\$174.68	\$500	\$14,649.16
5	\$14,649.16	\$183.11	\$500	\$15,332.27
6	\$15,332.27	\$191.65	\$500	\$16,023.93
7	\$16,023.93	\$200.30	\$500	\$16,724.22
8	\$16,724.22	\$209.05	\$500	\$17,433.28
9	\$17,433.28	\$217.92	\$500	\$18,151.19
10	\$18,151.19	\$226.89	\$500	\$18,878.08
11	\$18,878.08	\$235.98	\$500	\$19,614.06
12	\$19,614.06	\$245.18	\$500	\$20,359.23
13	\$20,359.23	\$254.49	\$500	\$21,113.73
14	\$21,113.73	\$263.92	\$500	\$21,877.65
15	\$21,877.65	\$273.47	\$500	\$22,651.12
16	\$22,651.12	\$283.14	\$500	\$23,434.26
17	\$23,434.26	\$292.93	\$500	\$24,227.18
18	\$24,227.18	\$302.84	\$500	\$25,030.02
19	\$25,030.02	\$312.88	\$500	\$25,842.90
20	\$25,842.90	\$323.04	\$500	\$26,665.94

(b) Adjusting cell D3 to \$550 produces the following balance after 5 years or 20 quarters.

16	\$23,470.43	\$293.38	\$550	\$24,313.81
17	\$24,313.81	\$303.92	\$550	\$25,167.74
18	\$25,167.74	\$314.60	\$550	\$26,032.33
19	\$26,032.33	\$325.40	\$550	\$26,907.74
20	\$26,907.74	\$336.35	\$550	\$27,794.08

\$27 794.08 – \$26 665.94 = \$1128.14

(c) Change cell C3 to “=B3*0.016 25” and cell D3 back to \$500 and use the fill down features to produce the following balance after 5 years.

16	\$23,698.57	\$385.10	\$500	\$24,583.67
17	\$24,583.67	\$399.48	\$500	\$25,483.15
18	\$25,483.15	\$414.10	\$500	\$26,397.25
19	\$26,397.25	\$428.96	\$500	\$27,326.21
20	\$27,326.21	\$444.05	\$500	\$28,270.26

\$28 270.26 – \$27 794.08 = \$476.18

(d) Answers will vary.

(e) Answers will vary.

10. (a) Adjust the spreadsheet cells as shown and use the fill down features to produce the table shown. The payment values are adjusted so that the balance after 4 years or 16 payments is closest to \$12 000. This occurs when the payment is \$669.18, as shown below.

	A	B	C	D	E
1	Period	Prev.	Interest	Pay.	New
2		Bal.	At 6%/a	Made	Balance
3	1	0	=B3*0.015	\$669.18	=B3+C3 + D3
4	=A3+1	=E3	=B4*0.015	=D\$3	=B4+C4 + D4

Per.	Previous	Interest	Payment	New
	Balance	At 6%/a	Made	Balance
1	\$0.00	\$0.00	\$669.18	\$669.18
2	\$669.18	\$10.04	\$669.18	\$1,348.40
3	\$1,348.40	\$20.23	\$669.18	\$2,037.80
4	\$2,037.80	\$30.57	\$669.18	\$2,737.55
5	\$2,737.55	\$41.06	\$669.18	\$3,447.79
6	\$3,447.79	\$51.72	\$669.18	\$4,168.69
7	\$4,168.69	\$62.53	\$669.18	\$4,900.40
8	\$4,900.40	\$73.51	\$669.18	\$5,643.09
9	\$5,643.09	\$84.65	\$669.18	\$6,396.91
10	\$6,396.91	\$95.95	\$669.18	\$7,162.05
11	\$7,162.05	\$107.43	\$669.18	\$7,938.66
12	\$7,938.66	\$119.08	\$669.18	\$8,726.92
13	\$8,726.92	\$130.90	\$669.18	\$9,527.00
14	\$9,527.00	\$142.91	\$669.18	\$10,339.09
15	\$10,339.09	\$155.09	\$669.18	\$11,163.35
16	\$11,163.35	\$167.45	\$669.18	\$11,999.98

(b) Change cell C3 to “=B3*0.005” to reflect the interest of 6%/a compounded monthly. The payment values are adjusted so that the balance after 4 years or 48 payments is closest to \$1200. This occurs when the payment is \$221.82, as shown below.

42	\$10,066.11	\$50.33	\$221.82	\$10,338.26
43	\$10,338.26	\$51.69	\$221.82	\$10,611.77
44	\$10,611.77	\$53.06	\$221.82	\$10,886.65
45	\$10,886.65	\$54.43	\$221.82	\$11,162.91
46	\$11,162.91	\$55.81	\$221.82	\$11,440.54
47	\$11,440.54	\$57.20	\$221.82	\$11,719.56
48	\$11,719.56	\$58.60	\$221.82	\$11,999.98

(c) \$221.82 multiplied by three gives \$665.46 which is less than \$669.18. By making monthly payments the balance is reduced each month rather than every three 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.

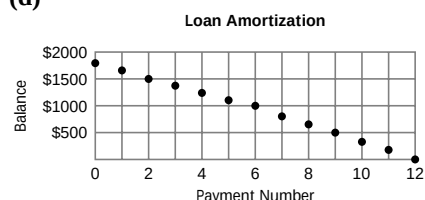
11. (a) The interest rate per payment interval is $\frac{0.18}{12} = 0.015$ or 1.5%/month.

(b) and (c)

	A	B	C	D	E
1	Pay.	Amount	Interest	Princ.	Out.
2	Number	Paid	Paid	Paid	Bal.
3	0	-----	-----	-----	\$1,800
4	=A3+1	\$165.25	=E3*0.015	=B4-C4	=E3+C4-B4

Pay. #	Amount Paid	Int. Paid	Principal Paid	Balance
0				\$1,800.00
1	\$165.25	\$27.00	\$138.25	\$1,661.75
2	\$165.25	\$24.93	\$140.32	\$1,521.43
3	\$165.25	\$22.82	\$142.43	\$1,379.00
4	\$165.25	\$20.68	\$144.57	\$1,234.43
5	\$165.25	\$18.52	\$146.73	\$1,087.70
6	\$165.25	\$16.32	\$148.93	\$938.76
7	\$165.25	\$14.08	\$151.17	\$787.60
8	\$165.25	\$11.81	\$153.44	\$634.16
9	\$165.25	\$9.51	\$155.74	\$478.42
10	\$165.25	\$7.18	\$158.07	\$320.35
11	\$165.25	\$4.81	\$160.44	\$159.90
12	\$165.25	\$2.40	\$162.85	-\$2.95

(d)



12. The amount financed is \$2,200 (\$2700 – \$500) and the payment is \$144.60. Cells B4 and E3 are adjusted and the interest amount in cell C4 is varied until the outstanding balance of –\$0.05. The yearly interest rate, compounded monthly, that the store is charging for using the payment plan is 22% ($12 \times 0.018333 \times 100\%$).

	A	B	C	D	E
1	Pay.	Amount	Interest	Princ.	Out.
2	#	Paid	Paid	Paid	Balance
3	0	-----	-----	-----	\$2,000
4	=A3+1	\$144.60	=E4*0.018 333	=B4–C4	=E3+C4–B4

13. By depositing \$1000 starting on her 15th birthday, Bev will have \$17 888.45 on her 26th birthday and Cindy will have \$1000 on her 26th birthday. One solution is to create a spreadsheet as shown below.

Birthday Number	Bev's Old Balance	Interest at 7.0%/a	Bev's New Balance
27	\$17,888.45	\$1,252.19	\$19,140.64
28	\$19,140.64	\$1,339.84	\$20,480.49
29	\$20,480.49	\$1,433.63	\$21,914.12
30	\$21,914.12	\$1,533.99	\$23,448.11
31	\$23,448.11	\$1,641.37	\$25,089.48
32	\$25,089.48	\$1,756.26	\$26,845.74
33	\$26,845.74	\$1,879.20	\$28,724.94
34	\$28,724.94	\$2,010.75	\$30,735.69
35	\$30,735.69	\$2,151.50	\$32,887.19
36	\$32,887.19	\$2,302.10	\$35,189.29
37	\$35,189.29	\$2,463.25	\$37,652.54
38	\$37,652.54	\$2,635.68	\$40,288.22
39	\$40,288.22	\$2,820.18	\$43,108.39
40	\$43,108.39	\$3,017.59	\$46,125.98
41	\$46,125.98	\$3,228.82	\$49,354.80
42	\$49,354.80	\$3,454.84	\$52,809.63
43	\$52,809.63	\$3,696.67	\$56,506.31
44	\$56,506.31	\$3,955.44	\$60,461.75
45	\$60,461.75	\$4,232.32	\$64,694.07
46	\$64,694.07	\$4,528.59	\$69,222.66
47	\$69,222.66	\$4,845.59	\$74,068.24
48	\$74,068.24	\$5,184.78	\$79,253.02
49	\$79,253.02	\$5,547.71	\$84,800.73
50	\$84,800.73	\$5,936.05	\$90,736.78

Birthday Number	Cindy's Old Balance	Interest at 7.0%/a	Payment Made	Bev's New Balance
27	\$1,000.00	\$70.00	\$1,000.00	\$2,070.00
28	\$2,070.00	\$144.90	\$1,000.00	\$3,214.90
29	\$3,214.90	\$225.04	\$1,000.00	\$4,439.94
30	\$4,439.94	\$310.80	\$1,000.00	\$5,750.74
31	\$5,750.74	\$402.55	\$1,000.00	\$7,153.29
32	\$7,153.29	\$500.73	\$1,000.00	\$8,654.02
33	\$8,654.02	\$605.78	\$1,000.00	\$10,259.80
34	\$10,259.80	\$718.19	\$1,000.00	\$11,977.99
35	\$11,977.99	\$838.46	\$1,000.00	\$13,816.45
36	\$13,816.45	\$967.15	\$1,000.00	\$15,783.60
37	\$15,783.60	\$1,104.85	\$1,000.00	\$17,888.45
38	\$17,888.45	\$1,252.19	\$1,000.00	\$20,140.64
39	\$20,140.64	\$1,409.85	\$1,000.00	\$22,550.49
40	\$22,550.49	\$1,578.53	\$1,000.00	\$25,129.02
41	\$25,129.02	\$1,759.03	\$1,000.00	\$27,888.05
42	\$27,888.05	\$1,952.16	\$1,000.00	\$30,840.22
43	\$30,840.22	\$2,158.82	\$1,000.00	\$33,999.03
44	\$33,999.03	\$2,379.93	\$1,000.00	\$37,378.96
45	\$37,378.96	\$2,616.53	\$1,000.00	\$40,995.49
46	\$40,995.49	\$2,869.68	\$1,000.00	\$44,865.18
47	\$44,865.18	\$3,140.56	\$1,000.00	\$49,005.74
48	\$49,005.74	\$3,430.40	\$1,000.00	\$53,436.14
49	\$53,436.14	\$3,740.53	\$1,000.00	\$58,176.67
50	\$58,176.67	\$4,072.37	\$1,000.00	\$63,249.04

From the spreadsheet, it appears that Cindy's balance will never catch up to Bev's. The balances for ages 81 to 85 appear below. The interest Bev earns is always greater than

the interest and deposit Cindy makes. Cindy will never catch up.

Birthday	Bev's Old	Interest	Bev's New
Number	Balance	at 7.0%/a	Balance
81	\$690,711.53	\$48,349.81	\$739,061.34
82	\$739,061.34	\$51,734.29	\$790,795.63
83	\$790,795.63	\$55,355.69	\$846,151.33
84	\$846,151.33	\$59,230.59	\$905,381.92
85	\$905,381.92	\$63,376.73	\$968,758.65

Birthday	Cindy's Old	Interest	Payment	Cindy's New
Number	Balance	at 7.0%/a	Made	Balance
81	\$575,928.59	\$40,315.00	\$1,000.00	\$617,243.59
82	\$617,243.59	\$43,207.05	\$1,000.00	\$661,450.65
83	\$661,450.65	\$46,301.55	\$1,000.00	\$708,752.19
84	\$708,752.19	\$49,612.65	\$1,000.00	\$759,364.84
85	\$759,364.84	\$53,155.54	\$1,000.00	\$813,520.38

14. (a) Modify the spreadsheet as shown below to produce a balance of \$27 046.45 after 6 years.

	A	B	C	D	E
1	Period	Prev.	Interest	Pay.	New
2		Bal.	At 8.0%/a	Made	Balance
3	1	0	= B3*0.04	\$1800	= B3+C3 + D3
4	=A3+1	=E3	=B4*0.04	=\$D\$3	= B4+C4 + D4

(b) Change cell D4 to “= D3*1.1” to increase the payment by 10% every 6 months. Use the fill down feature to produce the following results. The balance after 6 years will be \$46 121.88.

Period	Previous	Interest	Payment	New
	Balance	At 8.0%/a	Made	Balance
1	\$0.00	\$0.00	\$1,800.00	\$1,800.00
2	\$1,800.00	\$72.00	\$1,980.00	\$3,852.00
3	\$3,852.00	\$154.08	\$2,178.00	\$6,184.08
4	\$6,184.08	\$247.36	\$2,395.80	\$8,827.24
5	\$8,827.24	\$353.09	\$2,635.38	\$11,815.71
6	\$11,815.71	\$472.63	\$2,898.92	\$15,187.26
7	\$15,187.26	\$607.49	\$3,188.81	\$18,983.56
8	\$18,983.56	\$759.34	\$3,507.69	\$23,250.59
9	\$23,250.59	\$930.02	\$3,858.46	\$28,039.08
10	\$28,039.08	\$1,121.56	\$4,244.31	\$33,404.95
11	\$33,404.95	\$1,336.20	\$4,668.74	\$39,409.88
12	\$39,409.88	\$1,576.40	\$5,135.61	\$46,121.88

$$15. i = \frac{0.15}{2} = 0.0125, R = 225, n = 3 \times 12 = 36$$

$$PV = \frac{R(1 - (1 + i)^{-n})}{i}$$

$$= \frac{225(1 - (1 + 0.0125)^{-36})}{0.0125}$$

$$= 6490.64$$

This is only 90% of the price Stephanie paid because she paid 10% down. Therefore, \$6490.64 ÷ 90% = \$7211.82.

16. Answers will vary.

17. (a) The problem represents an annuity with an initial value of \$13 200. Find the interest rate that reduces the outstanding balance to \$0 after 24 payments. Estimate a reasonable monthly interest rate and create a spreadsheet.

	A	B	C	D	E
1	Per.	Bal.	Interest at 14%/a	Pay. Made	New Bal.
2	1	\$13,200	=B2*0.01167	\$633.77	=B2+C2 -D2
3	=A2+1	= E2	=B3*0.01167	=\$D\$2	=B3+C3 -D3

Use the fill down feature. Notice that 1.167%/month is the best estimate, as shown below.

22	\$1,858.45	\$21.69	\$633.77	\$1,246.36
23	\$1,246.36	\$14.55	\$633.77	\$627.14
24	\$627.14	\$7.32	\$633.77	\$0.69
25	\$0.69	\$0.01	\$633.77	\$-633.07
26	\$-633.07	\$-7.39	\$633.77	\$-1,274.23

The annual interest rate is 14%/a compounded monthly.

$$(b) i = \frac{0.08}{12} = 0.0067$$

The term is 2 years or 24 months. Create a spreadsheet. Change cell B2 in part (a) to “16 200”. Change cell C2 to “= B2*0.0067”. Estimate a reasonable monthly payment so the final balance is as close as possible to \$0 after 24 payments. Use the fill down feature. Notice that \$732.68 is the best estimate, as shown below.

22	\$2,176.48	\$14.58	\$732.68	\$1,458.38
23	\$1,458.38	\$9.77	\$732.68	\$735.48
24	\$735.48	\$4.93	\$732.68	\$7.72
25	\$7.72	\$0.05	\$732.68	\$-724.90
26	\$-724.90	\$-4.86	\$732.68	\$-1,462.44

(c) The advertised value is based on \$13 200 being borrowed because of the \$3000 down payment.

(d) Amount to be financed = \$16 200 – \$3000 = \$13 200

$$p = \frac{0.08}{12} = 0.0067$$

$$PV = R \times \frac{1 - (1 + p)^{-n}}{p}$$

$$R = \frac{PVP}{1 - (1 + p)^{-n}}$$

$$= \frac{13\,200(0.0067)}{1 - (1 + 0.0067)^{-24}}$$

$$= \$597.00$$

Bank: \$597.00 × 24 + \$3000 = \$17 328

Truck dealer: \$633.77 × 24 + \$3000 = \$18 210.48

Difference = \$18 210.48 – \$17 328 = \$882.48

His payments would be \$597.00 and he would save \$882.48.

18. (a)

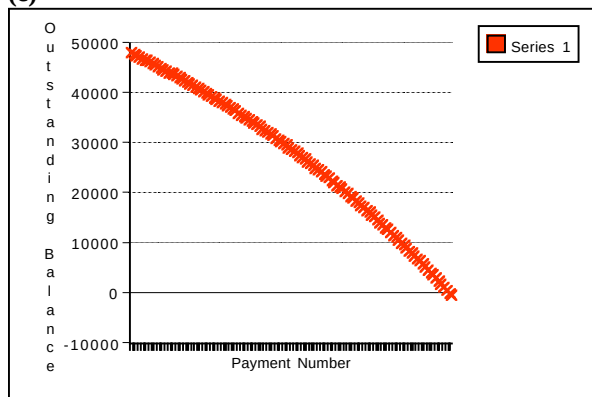
Pay. #	Payment	Int. Paid	Princ. Paid	Out. Bal.
0				\$48,000.00
1	\$595.00	\$336.00	\$259.00	\$47,741.00
2	\$595.00	\$334.19	\$260.81	\$47,480.19
...	...	...	...	...
119	\$595.00	\$5.10	\$589.90	\$138.89
120	\$595.00	\$0.97	\$594.03	-\$455.14

(b) It will take 120 months to repay the loan.

(c) The final payment will be $\$138.89 + \$0.97 = \$139.86$.

(d) Add column C of the spreadsheet. The total interest is \$22 944.86.

(e)



(f) $\$48\,000 \times 10\% = \$4800$

$\$48\,000 - \$4800 = \$43\,200$

Change cell B2 to “43 200”.

98	\$2,769.1 2	\$19.38	\$595.00	\$2,193.5 1
99	\$2,193.5 1	\$15.35	\$595.00	\$1,613.8 6
100	\$1,613.8 6	\$11.30	\$595.00	\$1,030.1 6
101	\$1,030.1 6	\$7.21	\$595.00	\$442.37
102	\$442.37	\$3.10	\$595.00	-\$149.53

The loan would be paid in 102 months or 18 (120 – 102) months sooner.

(g)

Per.	Balance	Int. Pay. #1 at 8%/a	Int. Pay. #2 at 8%/a	Pay. Made	New Balance
1	\$0.00	\$0.00	\$0.00	\$3000	\$3000
2	\$3,000.00	\$120.00	\$124.80	\$3000	\$6,244.80
3	\$6,244.80	\$249.79	\$259.78	\$3000	\$9,754.38
4	\$9,754.38	\$390.18	\$405.78	\$3000	\$13,550.33
5	\$13,550.33	\$542.01	\$563.69	\$3000	\$17,656.04

$120 \times \$595 + \$139.86 = \$71\,539.86$

$111 \times \$595 + \$367.02 = \$66\,412.02$

$\therefore$ about $\$71\,539.86 - \$66\,412.02 = \$5127.84$

about \$5127.84

$$19. (a) i = \frac{0.066}{12} = 0.0055$$

Period	Balance	Interest	Payment	New
		at 6.6%/a	Made	Balance
1	\$0.00	\$0.00	\$200.00	\$200.00
2	\$200.00	\$1.10	\$200.00	\$401.10
3	\$401.10	\$2.21	\$200.00	\$603.31
4	\$603.31	\$3.32	\$200.00	\$806.63
5	\$806.63	\$4.44	\$200.00	\$1,011.07
6	\$1,011.07	\$5.56	\$200.00	\$1,216.63
7	\$1,216.63	\$6.69	\$200.00	\$1,423.32
8	\$1,423.32	\$7.83	\$200.00	\$1,631.14

(b)

Period	Balance	Interest	Payment	New
		at 6.6%/a	Made	Balance
0	\$0.00	\$0.00	\$200.00	\$200.00
1	\$200.00	\$1.10	\$200.00	\$401.10
2	\$401.10	\$2.21	\$200.00	\$603.31
3	\$603.31	\$3.32	\$200.00	\$806.63
4	\$806.63	\$4.44	\$200.00	\$1,011.07
5	\$1,011.07	\$5.56	\$200.00	\$1,216.63
6	\$1,216.63	\$6.69	\$200.00	\$1,423.32
7	\$1,423.32	\$7.83	\$200.00	\$1,631.14
8	\$1,613.14	\$8.97	\$0.00	\$1,640.11

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.

$$21. i = \frac{0.08}{2} = 0.04$$

Period	Balance	Interest	Payment	New
		at 8%/a	Made	Balance
1	\$0.00	\$0.00	\$0.00	\$0.00
2	\$0.00	\$0.00	\$3,000.00	\$3,000.00
3	\$3,000.00	\$120.00	\$0.00	\$3,120.00
4	\$3,120.00	\$124.80	\$3,000.00	\$6,244.80
5	\$6,244.80	\$249.79	\$0.00	\$6,494.59
6	\$6,494.59	\$259.78	\$3,000.00	\$9,754.38
7	\$9,754.38	\$390.17	\$0.00	\$10,144.55
8	\$10,144.55	\$405.78	\$3,000.00	\$13,550.33
9	\$13,550.33	\$542.01	\$0.00	\$14,092.35
10	\$14,092.35	\$563.69	\$3,000.00	\$17,656.04