Solution Outline to Chapter 4 Problems.

Set Calculator to P/YR=12 Make sure BEGIN is not displayed

4-1. PMT(PV=-80000, I/YR=10, N=360) = 702.06

4-2. PV(PMT=600, I/YR=9.5, N=360) = 71,356.01

4-3. PMT(PV=-120000, I/YR=9, N=360) = 965.55
By formula, the first month interest is: Int = 9/1200 * 120000 = 900.00
By Amortization function in Calculator, 1 INPUT 1 ■ AMORT Interest = 900
First year interest, 1 INPUT 12 ■ AMORT Interest = 10766.70
Balance at month 36: 1 INPUT 36 ■ AMORT Balance = 117,320.40
Interest over 3 year period: 1 INPUT 36 ■ AMORT Interest = 32,062.20

4-4. I/YR(PV=-75000, PMT=590.03, N=360) = 8.75

4-5. Loan amount = 0.95 * 125000 * 0.80 = 95,000.00
PMT(PV=-95000, I/YR=9.5, N=360) = 798.81
1 INPUT 60 ■ AMORT Balance = 91,429.04
Payment every year is 12* 798.81 = 9,585.74

1 INPUT 12 ■ AMORT	PRIN = 585.80	INT = 8,999.92	BAL = 94,414.20
13 INPUT 24 ■ AMORT	PRIN = 643.92	INT = 8,941.80	BAL = 96,770.28
25 INPUT 36 ■ AMORT	PRIN = 707.83	INT = 8,877.89	BAL = 93,062.45
37 INPUT 48 ■ AMORT	PRIN = 778.09	INT = 8,807.63	BAL = 92,284.36
49 INPUT 60 ■ AMORT	PRIN = 855.32	INT = 8,730.40	BAL = 91,429.04

4-6. Note: This problem is similar to the examples in class titled "Effective Interest Cost Example. The solution provided below is for the first loan noted. Take the same steps for the other two loans. The loan amount does not matter, so choose 100,000 for ease. The solution is set up for efficiency, rather than to follow the order of the questions.
Cash disbursed for first loan is (1-0.0275) * 100,000 = 97250
PMT(PV=-100000, I/YR=8.25, N=360) = 751.27
60 INPUT 60 ■ AMORT BAL = 95,283.74 (*1.03 = 98,142.25 with penalty)
I/YR(PV=-97250, PMT=751.27, N=360) = 8.55 which is the FTLAPR if rounded
I/YR(PV=-97250, PMT=751.27, N=60, FV = 95283.74) = 8.95
I/YR(PV=-97250, PMT=751.27, N=60, FV = 98142.25) = 9.41

4-7. PMT(PV=-90000, I/YR=10, N=360) = 789.81
PMT(PV=-90000, I/YR=11, N=300) = 882.10
PMT(PV=-90000, I/YR=9, N=300) = 755.28
PMT(PV=-90000, I/YR=8, N=260) = 729.67

4-8. I/YR(PMT=500, N=360, PV=-50000) = 11.63
I/YR(PMT=600, N=360, PV=-65000) = 10.61
I/YR(PMT=550, N=260, PV=-62000) = 9.18
I/YR(PMT=550, N=300, PV=-60000) = 10.11

4-9. N(PMT=400, I/YR=10.0, PV=-45000) = 334.10
N(PMT=800, I/YR=10.5, PV=-75000) = 197.03
N(PMT=600, I/YR=11.0, PV=-62000) = 322.38
N(PMT=550, I/YR=11.0, PV=-60000) = Never – this is a bullet loan

4-10. PV(PMT=800, I/YR=10, N=360) = 91,160.66 so Points $ = 8,839.34
PV(PMT=900, I/YR=10, N=360) = 102,255.74 so Points $ = 7,444.26
PV(PMT=950, I/YR=10, N=360) = 108253.28 so Points $ = 16,746.72
PV(PMT=700, I/YR=10, N=360) = 79765.57 so Points $ = 30,234.43

4-11. PMT(PV=-100000, I/YR=10, N=360) = 877.57
PV(PMT=877.57, I/YR=10, N=300) = -96,574.32
PMT(PV=-90000, I/YR=8, N=360) = 660.39
PV(PMT=660.39, I/YR=8, N=300) = -85,562.87
PMT(PV=-80000, I/YR=12, N=360) = 822.89
PV(PMT=822.89, I/YR=12, N=300) = -78,130.57

4-12. Note: This problem is similar to the examples in class titled "Effective Interest Cost Example. The solution provided below is for the first loan noted. The solution is set up for efficiency, rather than to follow the order of the questions.
Cash disbursed for loan is (1-0.02) * 120,000 = 117600
PMT(PV=-120000, I/YR=6, N=180) = 1,012.63
96 INPUT 96 ■ AMORT BAL = 69317.30
I/YR(PV=-117600, PMT=1012.63, N=180) = 6.32 which is the FTLAPR if rounded
I/YR(PV=-97250, PMT=751.27, N=96, FV = 69317.30) = 6.39

4-13. PMT = 110000*7.5/1200 = 687.50 (Interest only on bullet loan for 120 months)
PMT(PV=-110000, I/YR=7.5, N=240) = 886.15 during 240 month amortization period
Note: Amount disbursed = (1-0.02) * 110000 = 107800
The APR is the IRR, which because we have a non constant cash flow, we need to use the CF feature on the Calculator. Also, the HP 10 BII only allows up to 99 cash flows to be repeated so if there are more than 99 CF's one has to enter the CF more than once so that each Nj is not more than 99 and the total is the number required. The setup below works.

CFj	Nj
-107800	
687.50	60
687.50	60
886.15	80
886.15	80
886.15	80

■ IRR = 7.69, can be rounded to closest 1/8 for FTLAPR

If the loan was repaid after 6 years, what would be the effective cost of the loan? Because we are in the non amortizing part of the loan, we know the balance is 110000 so the solution is:
I/YR(PMT=687.50, N=72, PV=-107800 FV = 110000) = 7.92

However, the problem asked it the loan was back after 16 years (6 years into the amortizing portion), what is the effective cost of the loan? Now one has to determine the balance after 6 years during the amortizing period, and allow for the reset of the payment. Starting with the calculator set to the reset period, that is:
PMT(PV=-110000, I/YR=7.5, N=240) = 886.15
72 INPUT 82 ■ AMORT BAL = 92006.53
Recall on the last date, the regular payment plus the balance after the regular payment will be due, so the final payment will be 886.15 + 92006.53 = 92892.68

CFj	Nj
-107800	
687.50	60
687.50	60
886.15	71
92892.68	

■ IRR = 7.72, which is slightly higher than if the loan is held to term as the effective of the points is spread over a short period.

4-14. PMT(PV=-90000, I/YR=6, N=360) = 539.60
84 INPUT 84 ■ AMORT BAL = 80674.95
PMT(PV=-80674.95, I/YR=8, N=276) = 640.12
60 INPUT 60 ■ AMORT BAL = 73159.23
I/YR(PV=-87300, PMT=539.60, N=360) = 6.29 which is the FTLAPR if rounded

CFj	Nj
-87300.00	
539.60	84
640.12	59
73799.35	

■ IRR = 6.99 which is an APR, press ■ EFF% for EAR = 7.22