CHAPTER 6 DISCOUNTED CASH FLOW VALUATION

Answers to Concepts Review and Critical Thinking Questions

- 1. The four pieces are the present value (PV), the periodic cash flow (C), the discount rate (r), and the number of payments, or the life of the annuity, t.
- 2. Assuming positive cash flows, both the present and the future values will rise.
- 3. Assuming positive cash flows, the present value will fall, and the future value will rise.
- 4. It's deceptive, but very common. The deception is particularly irritating given that such lotteries are usually government sponsored!
- 5. If the total money is fixed, you want as much as possible as soon as possible. The team (or, more accurately, the team owner) wants just the opposite.
- 6. The better deal is the one with equal installments.
- 7. Yes, they should. APRs generally don't provide the relevant rate. The only advantage is that they are easier to compute, but, with modern computing equipment, that advantage is not very important.
- **8.** A freshman does. The reason is that the freshman gets to use the money for much longer before interest starts to accrue.
- **9.** The subsidy is the present value (on the day the loan is made) of the interest that would have accrued up until the time it actually begins to accrue.
- **10.** The problem is that the subsidy makes it easier to repay the loan, not obtain it. However, ability to repay the loan depends on future employment, not current need. For example, consider a student who is currently needy, but is preparing for a career in a high-paying area (such as corporate finance!). Should this student receive the subsidy? How about a student who is currently not needy, but is preparing for a relatively low-paying job (such as becoming a college professor)?

Solutions to Questions and Problems

<u>Basic</u>

1. $PV@10\% = \$1,300 / 1.10 + \$500 / 1.10^2 + \$700 / 1.10^3 + 1,620 / 1.10^4 = \$3,227.44$ $PV@18\% = \$1,300 / 1.18 + \$500 / 1.18^2 + \$700 / 1.18^3 + 1,620 / 1.18^4 = \$2,722.41$ $PV@24\% = \$1,300 / 1.24 + \$500 / 1.24^2 + \$700 / 1.24^3 + 1,620 / 1.24^4 = \$2,425.93$

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- 2. X@5%: PVA = $3,000 \{ [1 (1/1.05)^8] / .05 \} = 19,389.64$ Y@5%: PVA = $5,000 \{ [1 - (1/1.05)^4] / .05 \} = 17,729.75$ X@22%: PVA = $3,000 \{ [1 - (1/1.22)^8] / .22 \} = 10,857.80$ Y@22%: PVA = $5,000 \{ [1 - (1/1.22)^4] / .22 \} = 12,468.20$
- 3. $FV@8\% = \$900(1.08)^3 + \$1,000(1.08)^2 + \$1,100(1.08) + 1,200 = \$4,688.14$ $FV@11\% = \$900(1.11)^3 + \$1,000(1.11)^2 + \$1,100(1.11) + 1,200 = \$4,883.97$ $FV@24\% = \$900(1.24)^3 + \$1,000(1.24)^2 + \$1,100(1.24) + 1,200 = \$5,817.56$
- 4. PVA@15 yrs: PVA = $4,100\{[1 (1/1.10)^{15}]/.10\} = 31,184.93$ PVA@40 yrs: PVA = $4,100\{[1 - (1/1.10)^{40}]/.10\} = 40,094.11$ PVA@75 yrs: PVA = $4,100\{[1 - (1/1.10)^{75}]/.10\} = 40,967.76$ PVA@forever: PVA = 4,100/.10 = 41,000.00
- 5. PVA = $20,000 = C[[1 (1/1.0825)^{12}] / .0825]; C = 20,000 / 7.4394 = 2,688.38$
- 6. $PVA = $75,000\{[1 (1/1.075)^8] / .075\} = $439,297.77;$ can afford the system.
- 7. $FVA = \$1,500[(1.095^{20} 1) / .095] = \$81,183.35$ $FVA = \$1,500[(1.095^{40} - 1) / .095] = \$579,779.99$
- 8. FVA = $$50,000 = C[(1.062^5 1) / .062];$ C = \$50,000 / 5.65965 = \$8,834.47
- 9. PVA = $35,000 = C[[1 (1/1.10)^7] / .10];$ C = 35,000 / 4.86842 = 7,189.19
- **10.** PV = \$5,000 / .09 = \$55,555.56
- **11.** PV = \$58,000 = \$5,000 / r; r = \$5,000 / \$58,000 = 8.62%
- **12.** EAR = $[1 + (.12 / 4)]^4 1$ = 12.55% EAR = $[1 + (.08 / 12)]^{12} - 1$ = 8.30% EAR = $[1 + (.07 / 365)]^{365} - 1$ = 7.25% EAR = $e^{.16} - 1$ = 17.35%
- **13.** $EAR = .072 = [1 + (APR / 2)]^2 1;$
 $EAR = .091 = [1 + (APR / 12)]^{12} 1;$
 $EAR = .185 = [1 + (APR / 52)]^{52} 1;$
 $EAR = .283 = e^{APR} 1;$ $APR = 2[(1.072)^{1/2} 1] = 7.07\%$
 $APR = 12[(1.091)^{1/12} 1] = 8.74\%$
 $APR = 52[(1.185)^{1/52} 1] = 17.00\%$
APR = ln 1.283 = 24.92%
- **14.** First National: EAR = $[1 + (.091 / 12)]^{12} 1 = 9.49\%$ First United: EAR = $[1 + (.092 / 2)]^2 - 1 = 9.41\%$
- **15.** $EAR = .14 = [1 + (APR / 365)]^{365} 1;$ $APR = 365[(1.14)^{1/365} 1] = 13.11\%$ The borrower is actually paying annualized interest of 14% per year, not the 13.11% reported on the loan contract.
- **16.** $FV = $600[1 + (.11/2)]^{40} = $5,107.99$

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- **17.** FV in 5 years = $$5,000[1 + (.063/365)]^{5(365)}$ = \$6,851.11FV in 10 years = $$5,000[1 + (.063/365)]^{10(365)}$ = \$9,387.54FV in 20 years = $$5,000[1 + (.063/365)]^{20(365)}$ = \$17,625.19
- **18.** $PV = \$19,000 / (1 + .12/365)^{6(365)} = \$9,249.39$
- **19.** APR = 12(25%) = 300%; EAR = $(1 + .25)^{12} 1 = 1,355.19\%$
- **20.** $PVA = \$4\$,250 = \$C[1 \{1 / [1 + (.098/12)]^{60}\} / (.098/12)]; C = \$4\$,250 / 47.284 = \$1,020.43$ EAR = $[1 + (.098/12)]^{12} - 1 = 10.25\%$
- **21.** $PVA = \$17,805.69 = \$400\{ [1 (1/1.015)^t] / .015\}; 1/1.015^t = 1 [(\$17,805.69)(.015) / (\$400)] 1.015^t = 1/(0.33223) = 3.0095; t = ln 3.0095 / ln 1.015 = 74 months$
- **22.** 3(1 + r) = 4; r = 4/3 1 = 33.33% per week APR = (52)33.33% = 1,733.33%; EAR = $[1 + .3333]^{52} - 1 = 313,916,515.70\%$
- **23.** PV = \$75,000 = \$1,050 / r; r = \$1,050 / \$75,000 = 1.40% per month Nominal return = 12(1.40%) = 16.80% per year; Effective return = $[1.0140]^{12} - 1 = 18.16\%$ per year
- **24.** FVA = $100[\{[1 + (.11/12)]^{240} 1\} / (.11/12)] = 886,563.80$
- **25.** EAR = $[1 + (.11/12)]^{12} 1 = 11.57\%$ FVA = $$1,200[(1.1157^{20} - 1) / .1157] = $82,285.81$
- **26.** $PVA = \$1,000\{[1 (1/1.0075)^{16}] / .0075\} = \$15,024.31$
- **27.** EAR = $[1 + (.14/4)]^4 1 = 14.75\%$ PV = $\$800 / 1.1475 + \$700 / 1.1475^2 + \$1,200 / 1.1475^4 = \$1,920.79$
- **28.** $PV = \$1,500 / 1.115 + \$7,200 / 1.115^3 + \$900 / 1.115^4 = \$7,121.66$

Intermediate

- **29.** $(.06)(10) = (1 + r)^{10} 1$; $r = 1.6^{1/10} 1 = 4.81\%$
- **30.** EAR = $.14 = (1 + r)^2 1$; $r = (1.14)^{1/2} 1$ = 6.77% per 6 months EAR = $.14 = (1 + r)^4 - 1$; $r = (1.14)^{1/4} - 1$ = 3.33% per quarter EAR = $.14 = (1 + r)^{12} - 1$; $r = (1.14)^{1/12} - 1$ = 1.10% per month
- **31.** FV = $3,000 [1 + (.029/12)]^6 [1 + (.15/12)]^6 = 3,279.30$ Interest = 3,279.30 - 3,000.00 = 279.30
- 32. First: \$95,000(.05) = \$4,750 per year (\$150,000 - 95,000) / \$4,750 = 11.58 years Second: $\$150,000 = \$95,000 [1 + (.05/12)]^{t}$ t = 109.85 months = 9.15 years

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- **33.** $FV = \$1(1.0172)^{12} = \1.23 $FV = \$1(1.0172)^{24} = \1.51
- **34.** FV = $(2,000) = (1,100)(1+.01)^{t}$; t = 60.08 months
- **35.** FV = $4 = 1(1 + r)^{(12/3)}$; r = 41.42%
- **36.** EAR = $[1 + (.10 / 12)]^{12} 1 = 10.4713\%$ PVA₁ = \$75,000 { $[1 - (1 / 1.104713)^2] / .104713$ } = \$129,346.65 PVA₂ = \$30,000 + \$55,000{ $[1 - (1/1.104713)^2] / .104713$ } = \$124,854.21
- **37.** $PVA = $10,000 [1 (1/1.095)^{20} / .095] = $88,123.82$
- **38.** G: PV = $-\$30,000 + [\$55,000 / (1 + r)^6] = 0; (1 + r)^6 = 55/30; r = (1.833)^{1/6} 1 = 10.63\%$ H: PV = $-\$30,000 + [\$90,000 / (1 + r)^{11}] = 0; (1 + r)^{11} = 90/30; r = (3.000)^{1/11} - 1 = 10.50\%$
- **39.** PVA falls as r increases, and PVA rises as r decreases FVA rises as r increases, and FVA falls as r decreases PVA@10% = $2,000 \{ [1 - (1/1.10)^{10}] / .10 \}$ = 12,289.13PVA@5% = $2,000 \{ [1 - (1/1.05)^{10}] / .05 \}$ = 15,443.47PVA@15% = $2,000 \{ [1 - (1/1.15)^{10}] / .15 \}$ = 10,037.54
- **40.** $FVA = \$18,000 = \$95[\{[1 + (.10/12)]^N 1 \} / (.10/12)];$ $1.00833^N = 1 + [(\$18,000)(.10/12) / 95]; N = \ln 2.57894 / \ln 1.00833 = 114.16 payments$
- **41.** $PVA = $40,000 = $825[{1 [1 / (1 + r)^{60}]}/r];$ solving on a financial calculator, or by trial and error, gives r = 0.727%; APR = 12(0.727) = 8.72%
- **42.** $PVA = \$1,000[(1 \{1 / [1 + (.075/12)]\}^{360}) / (.075/12)] = \$143,017.63$ balloon payment = (\$180,000 - 143,017.63) [1 + (.075/12)]^{360} = \$348,430.68
- **43.** $PV = $2,900,000/1.10 + $3,770,000/1.10^2 + $4,640,000/1.10^3 + $5,510,000/1.10^4 + $6,380,000/1.10^5 + $7,250,000/1.10^6 + $8,120,000/1.10^7 + $8,990,000/1.10^8 + $9,860,000/1.10^9 + $10,730,000/1.10^{10} = $37,734,712.25$
- 44. $PV = \$3,000,000/1.10 + \$3,900,000/1.10^2 + \$4,800,000/1.10^3 + \$5,700,000/1.10^4 + \$6,600,000/1.10^5 + \$7,500,000/1.10^6 + \$8,400,000/1.10^7 = \$26,092,064.36$ The PV of Shaq's contract reveals that Robinson did achieve his goal of being paid more than any other rookie in NBA history. The different contract lengths are an important factor when comparing the present value of the contracts. A better method of comparison would be to express the cost of hiring each player on an annual basis. This type of problem will be investigated in a later chapter.
- **45.** $PVA = 0.80(\$1,200,000) = \$9,300[\{1 [1 / (1 + r)]^{360}\}/r];$ solving on a financial calculator, or by trial and error, gives r = 0.9347% per month APR = 12(0.9347) = 11.22%; EAR = $(1.009347)^{12} - 1 = 11.81\%$

- **46.** PV = $95,000 / 1.14^3 = 64,122.29$; the firm will make a profit profit = 64,122.29 57,000.00 = 7,122.29 $57,000 = 95,000 / (1 + r)^3$; $r = (95/57)^{1/3} - 1 = 18.56\%$
- **47.** PV@0% = \$4 million; choose the 2^{nd} payout $PV@10\% = $4 / 1.1^{10} = $1,542,173.16$ million; choose the 1^{st} payout $PV@20\% = $4 / 1.2^{10} = $646,022.33$ million; choose the 1^{st} payout
- **48.** $PVA = $375,000\{[1 (1/1.11)^{40}] / .11\} = $3,356,644.06$
- **49.** $PVA = \$1,000\{[1 (1/1.12)^{13}] / .12\} = \$6,423.55$ $PV = \$6,423.55 / 1.12^7 = \$2,905.69$
- **50.** $PVA_1 = \$1,500 [\{1 1 / [1 + (.15/12)]^{48}\} / (.15/12)] = \$53,897.22$ $PVA_2 = \$1,500 [\{1 - 1 / [1 + (.12/12)]^{72}\} / (.12/12)] = \$76,725.59$ $PV = \$53,897.22 + \{\$76,725.59 / [1 + (.15/12)]^{48}\} = \$96,162.01$
- **51.** A: FVA = \$1,000 [{[1 + (.115/12)]¹²⁰ 1} / (.115/12)] = \$223,403.23 B: FV = \$223,403.23 = PV $e^{.08(10)}$; PV = \$223,403.23 $e^{-.8}$ = \$100,381.54
- **52.** PV@t=12: \$500 / .065 = \$7,692.31PV@t=7: $$7,692.31 / 1.065^5 = $5,614.47$
- **53.** $PVA = $20,000 = $1,883.33\{(1 [1 / (1 + r)]^{12}) / r\};$ solving on a financial calculator, or by trial and error, gives r = 1.932% per month APR = 12(1.932%) = 23.19%; $EAR = (1.01932)^{12} - 1 = 25.82\%$
- 54. FV@5 years = $30,000(1.09)^3 + 50,000(1.09)^2 + 85,000 = 183,255.87$ FV@10 years = $183,255.87(1.09)^5 = 281,961.41$
- **55.** Monthly rate = .14 / 12 = .0117; semiannual rate = $(1.0117)^6 1 = 7.21\%$ PVA = $\$8,000\{[1 - (1 / 1.0721)^{10}] / .0721\} = \$55,653.98$ PV@t=5; $\$55,653.98 / 1.0721^8 = \$31,893.27$ PV@t=3; $\$55,653.98 / 1.0721^{12} = \$24,143.51$ PV@t=0; $\$55,653.98 / 1.0721^{18} = \$15,902.03$
- **56.** *a.* $PVA = $475\{[1 (1/1.105)^6] / .105\} = $2,038.79$ *b.* $PVA = $475 + $475\{[1 - (1/1.105)^5] / .105\} = $2,252.86$
- **57.** PVA = \$48,000 / [1 + (.0925/12)] = \$47,632.83 $PVA = $47,632.83 = $C{[[1 - {1 / [1 + (.0925/12)]^{48}}] / (.0925/12)}; C = $1,191.01$

58.	<u>Year</u>	Beginning Balance	Total <u>Payment</u>	Interest <u>Payment</u>	Principal Payment	Ending Balance
	1	\$20,000.00	\$5,548.19	\$2,400.00	\$3,148.19	\$16,851.81
	2	16,851.81	5,548.19	2,022.22	3,525.98	13,325.83
	3	13,325.83	5,548.19	1,599.10	3,949.10	9,376.73
	4	9,376.73	5,548.19	1,125.21	4,422.99	4,953.75
	5	4,953.75	5,548.19	594.45	4,953.75	0.00

In the third year, \$1,599.10 of interest is paid.

Total interest over life of the loan = 2,400 + 2,022.22 + 1,599.10 + 1,125.21 + 594.45 = 7,740.97

		Beginning	Total	Interest	Principal	Ending
59.	Year	Balance	Payment [Variable]	Payment Payment	Payment Payment	Balance
	1	\$20,000.00	\$6,400.00	\$2,400.00	\$4,000.00	\$16,000.00
	2	16,000.00	5,920.00	1,920.00	4,000.00	12,000.00
	3	12,000.00	5,440.00	1,440.00	4,000.00	8,000.00
	4	8,000.00	4,960.00	960.00	4,000.00	4,000.00
	5	4,000.00	4,480.00	480.00	4,000.00	0.00
	In the thi	rd year, \$1,440 o	f interest is pai	d.		

Total interest over life of the loan = \$2,400 + 1,920 + 1,440 + 960 + 480 = \$7,200.00

- 60. \$20,000 = \$17,800 (1 + r); r = 12.36%Because of the discount, you only get the use of \$17,800, and the interest you pay on that amount is 12.36%, not 11%.
- 61. Net proceeds = \$13,000(1 .16) = \$10,920EAR = (\$13,000 / \$10,920) - 1 = 19.05%
- **62.** 10,000(1.12) = 10,000(0.97)(1 + r); r = (11,200 / 9,700) 1 = 15.46%
- 63. EAR = (1.14 / 0.98) 1 = 16.33%; the effective rate is not affected by the loan amount, since it drops out when solving for *r* (see previous problem).
- 64. Refundable fee: With the \$1,000 application fee, you will need to borrow \$151,000 to have \$150,000 after deducting the fee. Solve for the payment under these circumstances. $PVA = $151,000 = C \{[1 - 1/(1.00708)^{360}]/.00708\}$ and C = \$1,161.06Plug this monthly payment into the PVA formula. $PVA = $150,000 = $1,161.06[\{1 - [1 / (1 + r)]^{360}\}/r];$ Solving on a financial calculator, or by trial and error, gives r = 0.7144% per month APR = 12(0.7144%) = 8.57% $EAR = [1 + (.0857/12)]^{12} - 1 = 8.92\%$ Nonrefundable fee: APR = 8.50% $EAR = [1 + (.085/12)]^{12} - 1 = 8.84\%$

- **65.** $PVA = \$1,000 = (\$41.15)[\{1 [1/(1+r)]^{36}\}/r];$ solving on a financial calculator, or by trial and error, gives r = 2.30% per month APR = 12(2.30%) = 27.60%; $EAR = (1.0230)^{12} - 1 = 31.38\%$ It's called add-on interest because the interest amount of the loan is added to the principal amount of the loan before the loan payments are calculated.
- **66.** *a*. $PVA = \$80,000\{[1 (1/1.09)^{15}] / .09\} = \$644,855.07$ $FVA = \$644,855.07 = \$C[(1.09^{30} - 1) / .09]; C = \$4,730.88$
 - b. $FV = $644,855.07 = PV(1.09)^{30}$; PV = \$48,603.46
 - *c*. FV of trust fund deposit = $30,000(1.09)^{10} = 71,020.91$ FVA = $644,855.07 - 71,020.91 = C[(1.09^{30} - 1) / .09];$ C = 4,209.85Worker's contribution = 4,209.85 - 1,500 = 2,709.85
- 67. Without fee and annual rate = 17.90%: $$10,000 = $200{[1 - (1/1.0149167)^{t}] / .0149167}$ where .0149167 = .179/12 t = 92.51 months Without fee and annual rate = 8.90%: $$10,000 = $200{[1 - (1/1.00741667)^{t}] / .00741667}$ where .00741667 = .089/12 t = 62.71 months With fee and annual rate = 8.90%: $$10,200 = $200{[1 - (1/1.00741667)^{t}] / .00741667}$ where .00741667 = .089/12 t = 64.31 months
- **68.** $FV_1 = \$750(1.10)^5 = \$1,207.88$ $FV_2 = \$750(1.10)^4 = \$1,098.08$ $FV_3 = \$850(1.10)^3 = \$1,131.35$ $FV_4 = \$850(1.10)^2 = \$1,028.50$ $FV_5 = \$950(1.10)^1 = \$1,045.00$ Value at year six = \$1,207.88 + 1,098.08 + 1,131.35 + 1,028.50 + 1,045.00 + 950.00 = \$6,460.81 $FV = \$6,460.81(1.06)^{59} = \$201,063.32$ The policy is not worth buying; the future value of the policy is \$201K, but the policy contract will pay off \$175K.
- **69.** Find the monthly payment assuming $t = 15 \times 12 = 180$ $300,000 = C[\{1 - [1 / (1.0075)]^{180}\} / .0075]$ so C = 3,042.80Value of future payments @ t = 5: $3,042.80[\{1 - [1 / (1.0075)]^{120}\} / .0075] = 240,203.76$
- 70. PVA = $15,000[\{1 [1 / (1 + r)]^4\} / r] = FVA = 5,000\{[(1 + r)^6 1] / r\}$ (1 + r)¹⁰ - 4.00(1 + r)⁴ + 30.00 = 0 By trial and error, or using a root-solving calculator routine, r = 14.52%
- **71.** PV = \$8,000 / r = PVA = \$20,000[{1 [1 / (1 + r)]¹⁰ } / r] 0.4 = 1 - [1/(1 + r)]¹⁰; .6^{1/10} = 1/(1 + r); r = 5.24%

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72. EAR = $[1 + (.14/365)]^{365} - 1 = 15.02\%$ Effective 2-year rate = $1.1502^2 - 1 = 32.31\%$ PV@t=1 year ago: \$5,200 /.3231 = \$16,096.14 PV today = \$16,096.14(1.1502) = \$18,514.47 PV = \$16,096.14 / (1 + .1502)^2 = \$12,165.86

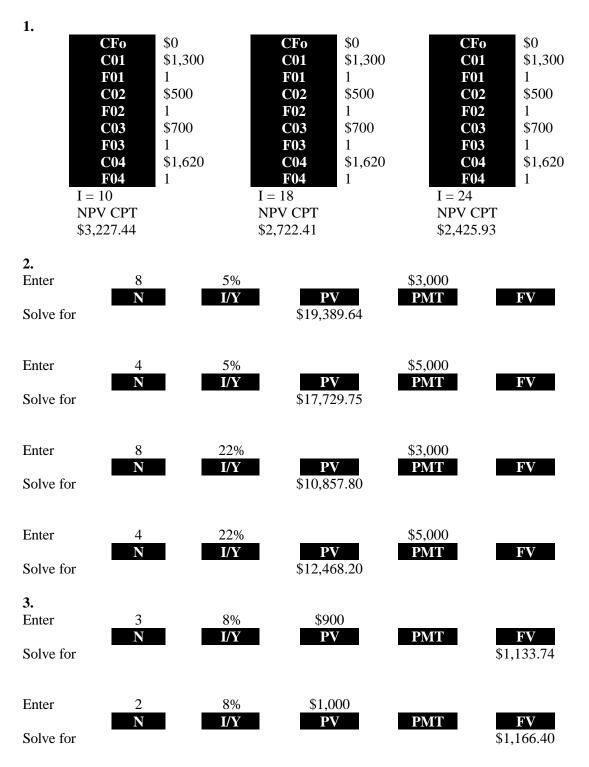
73.
$$PVA = \frac{\$C}{(1+r)} + \frac{\$C}{(1+r)^2} + \dots + \frac{\$C}{(1+r)^N}$$

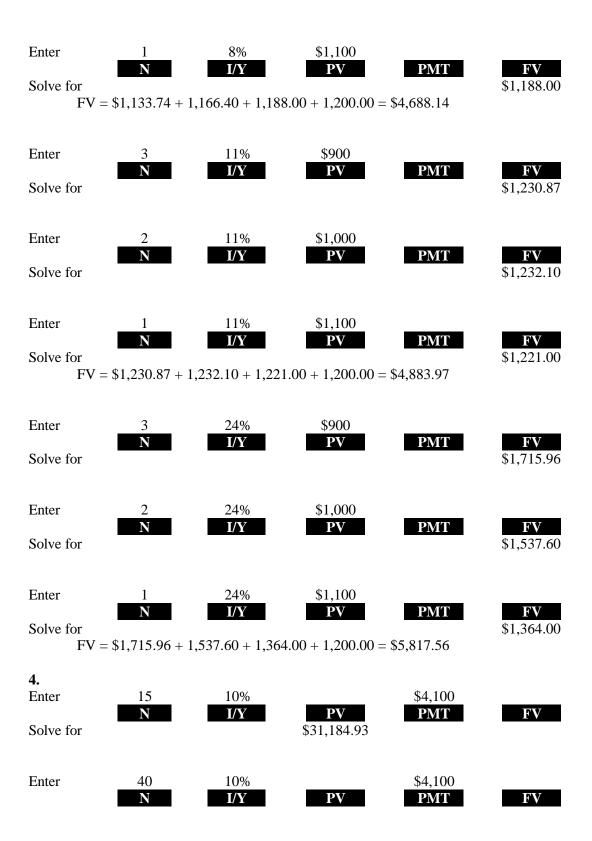
 $PVA_{due} = \$C + \frac{\$C}{(1+r)} + \dots + \frac{\$C}{(1+r)^{N-1}}$
 $PVA_{due} = (1+r) \left(\frac{\$C}{(1+r)} + \frac{\$C}{(1+r)^2} + \dots + \frac{\$C}{(1+r)^N} \right)$
 $PVA_{due} = (1+r) PVA$

$$\begin{split} FVA &= \$C + \$C(1+r) + \$C(1+r)^2 + \ldots + \$C(1+r)^{N-1} \\ FVA_{due} &= \$C(1+r) + \$C(1+r)^2 + \ldots + \$C(1+r)^N \\ FVA_{due} &= (1+r)[\$C + \$C(1+r) + \ldots + \$C(1+r)^{N-1}] \\ FVA_{due} &= (1+r)FVA \end{split}$$

- **74.** FV@*t*=7: $$50,000(1.13)^7 = $117,630.27$ PVA_{due} = \$117,630.27 = (1.13) $C \{ [1 - (1/1.13)^{10}] / .13 \};$ C = \$19,184.10
- **75.** *a*. APR = 52(11%) = 572%; EAR = $1.11^{52} 1 = 22,640.23\%$
 - b. APR = 572% / .89 = 642.70%; 642.70% / 52 = 12.36%; r = 12.36% per week EAR = $1.1236^{52} 1 = 42,727.20\%$
 - *c.* $PVA = \frac{63.95}{1 [1 / (1 + r)]^4} / r$]; using trial and error or a financial calculator gives r = 20.63% per week APR = 52(20.63%) = 1,072.90%; $EAR = 1.2063^{52} - 1 = 1,722,530.00\%$

Calculator Solutions

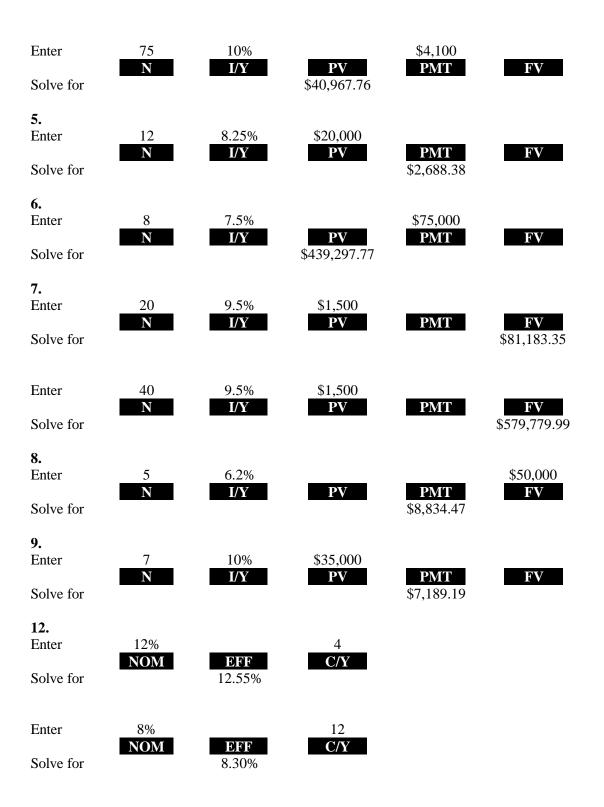




Solve for

\$40,094.11

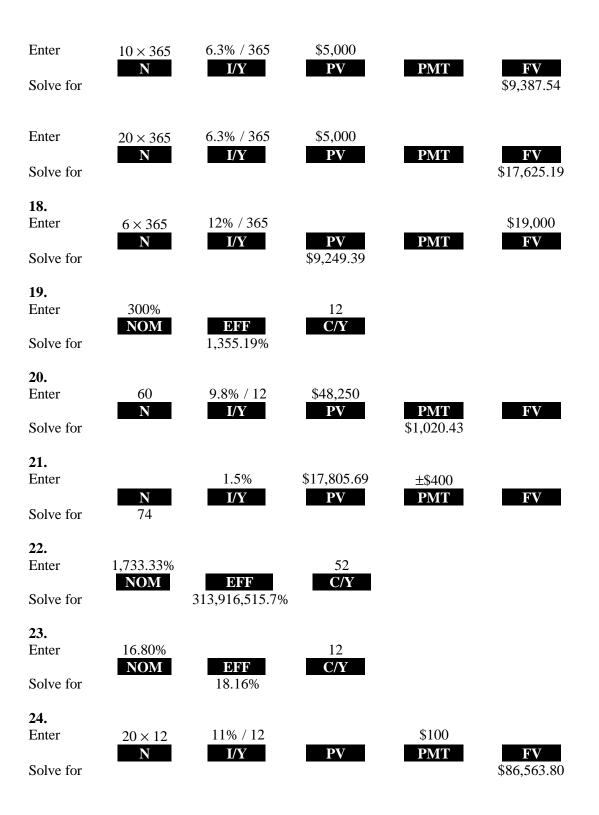
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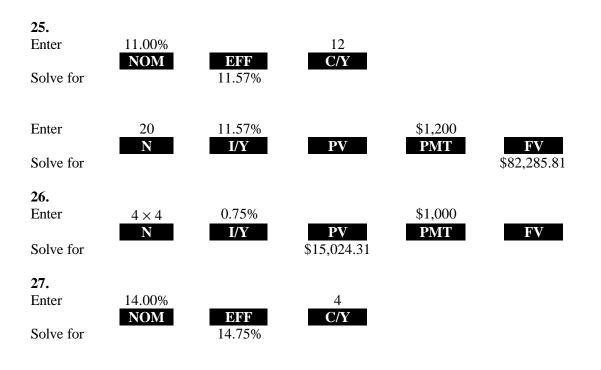


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Enter	7% NOM		365 C/Y		
Solve for	NOM	DRF 7.25%	C/Y		
13. Enter	NOM	7.2%	2		
Solve for	NOM 7.07%	EFF	C/Y		
Enter	NOM	9.1%	12 ON		
Solve for	NOM 8.74%	EFF	C/Y		
Enter	NOM	18.5% EFF	52 C/Y		
Solve for	17.00%		C/Y		
14. Enter	9.1% NOM	DFF	12 C/Y		
Solve for	NOM	9.49%	C/Y		
Enter	9.2% NOM	DDF	2 C/Y		
Solve for		9.41%			
15. Enter	NOM	14% DFF	365 C/Y		
Solve for	13.11%		0/1		
16. Enter	40 N	5.5%	\$600 PV	РМТ	FV
Solve for					\$5,107.99
17. Enter	5×365	6.3% / 365	\$5,000		
Solve for	N	I/Y	PV	PMT	FV \$6,851.11

B-54 SOLUTIONS



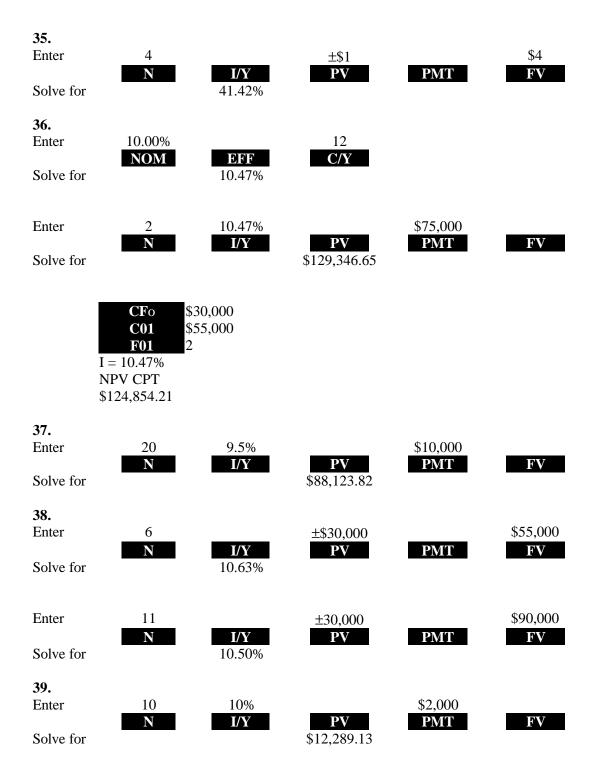


CFo	\$0
C01	\$800
F01	1
C02	\$700
F02	1
C03	\$0
F03	1
C04	\$1,200
F04	1
I = 14.752300	3%
NPV CPT	
\$1,920.79	

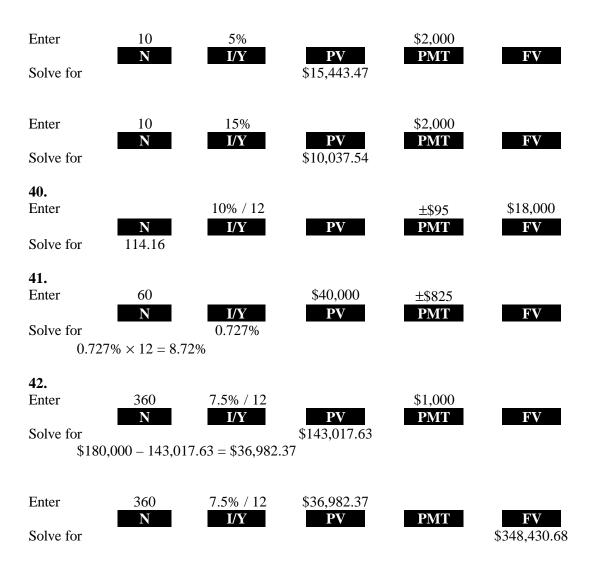
B-56 SOLUTIONS

NP'	F011C02\$0F021	500 200 00			
31. Enter	6	2.90% / 12	\$3,000		
Solve for	N	I/Y	\$3,000 PV	РМТ	FV \$3,043.76
Enter	6 N	15% / 12	\$3,043.76	DMT	
Solve for \$3,279	0.30 - 3,000 = 1	I/Y \$279.30	PV	PMT	FV \$3,279.30
32. Enter		5% / 12	±\$95,000		\$150,000
Solve for	N 109.85 5 / 12 = 9.15 ye	I/Y	PV	РМТ	FV
33.	12	1.72%	\$1		
Enter Solve for	N	1.72% I/Y	^{\$1} PV	PMT	FV \$1.23
Enter	24	1.72%	\$1	DM//P	
Solve for	Ν	I/Y	PV	PMT	FV \$1.51
34. Enter	N	1% I/Y	\$1,100 PV	PMT	±\$2,000 FV
Solve for	60.08				

Solve for 60.08



B-58 SOLUTIONS



43.

44.

	CFo	\$0		CF o \$0	
	C01 F01	\$2,900,000 1		C01 \$3,0 F01 1	00,000
	C02	\$3,770,000			00,000
	F02	1		F02 1	
	C03 F03	\$4,640,000			00,000
	F03 C04	1 \$5,510,000			00,000
	F04	1		F04 1	
	C05	\$6,380,000			00,000
	F05 C06	1 \$7,250,000		F05 1 C06 \$7,5	00,000
	F06	1		F06 1	00,000
	C07	\$8,120,000			00,000
	F07 C08	1 \$8,990,000		F07 1 C08	
	F08	1		F08	
	C09	\$9,860,000		C09	
	F09 C010	1 \$10,730,000		F09 C010	
	I = 10%	\$10,750,000	I =	= 10%	
	NPV CPT		NF	PV CPT	
	\$37,734,712.	25	\$20	6,092,064.36	
45.					
Enter	360		\$960,000	±\$9,300	
Solve for	Ν	I/Y 0.935%	PV	PMT	FV
	$PR = 0.935\% \times$				
Enter	11.22%		12		
Solve for	NOM	IEFF 11.81%	C/Y		
Solve Iol		11.0170			
46.					******
Enter	3 N	14% I/Y	PV	РМТ	\$95,000 FV
Solve for		1/1	\$64,122.29		
	of it = $$64,122.2$	29 - 57,000 = \$7,3			
Enter	3		±\$57,000		\$95,000
		T / T /	DY	DMT	\mathbf{FV}
Solve for	$\mathbf N$	I/Y 18.56%	PV	PMT	ΓV

B-60 SOLUTIONS

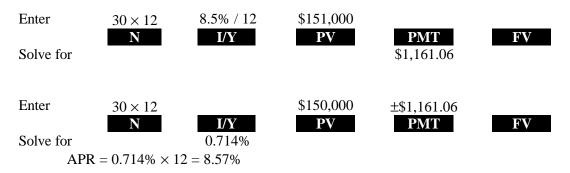
47. Enter Solve for	10 N	10 I/Y	PV \$1,542,173.16	PMT	\$4,000,000 FV
Enter Solve for	10 N	20 I/Y	PV \$646,022.33	PMT	\$4,000,000 FV
48. Enter Solve for	40 N	11% I/Y	PV \$3,356,644.06	\$375,000 PMT	FV
49. Enter Solve for	13 N	12% I/Y	PV \$6,423.55	\$1,000 PMT	FV
Enter Solve for	7 N	12% I/Y	PV \$2,905.69	PMT	\$6,423.55 FV
50. Enter Solve for	6×12 N	\$12% / 12	PV \$76,725.59	\$1,500 PMT	FV
Enter	4×12 N	15% / 12 I/Y	PV	\$1,500 PMT	\$76,725.59 FV
Solve for 52. PV@	t = 12: \$500 /	0.065 = \$7,692	\$96,162.01 2.31		
Enter Solve for	5 N	6.5% I/Y	PV \$5,614.47	PMT	\$7,692.31 FV
53. Enter Solve for APR	12 N = 1.923% × 12	1.932% = 23.19%	\$20,000 PV	±\$1,883.33 PMT	FV

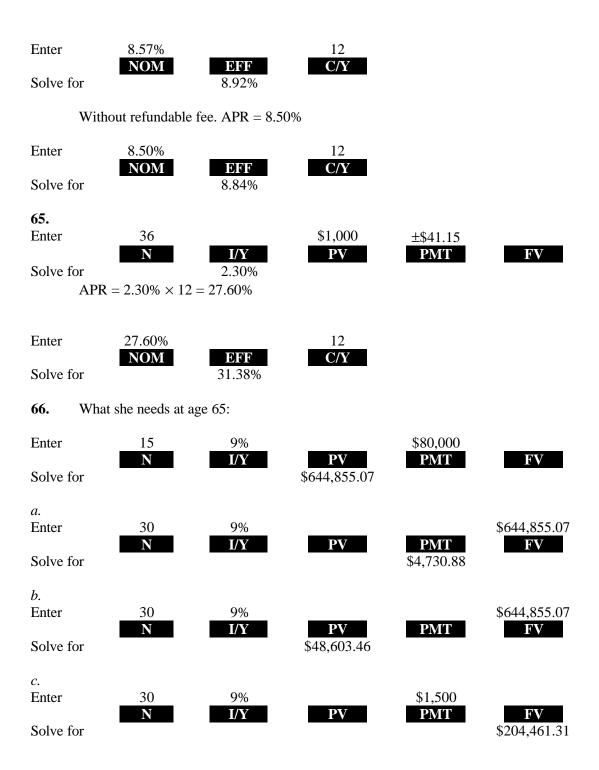
Enter	23.19%		12 C/Y		
Solve for	NOM	EFF 25.82%	CA		
54. Enter Solve for	3 N	9% I/Y	\$30,000 PV	РМТ	FV \$38,850.87
Enter Solve for Value	$\frac{2}{N}$ e at t = 5: \$38,8.	9% I/Y 50.87 + 59,405.	\$50,000 PV .00 + 85,000 = \$1	PMT 83,255.57	FV \$59,405.00
55. Mont	hly rate = $.14$ /	12 = .0117; sem	iannual rate = (1.1)	$(0117)^6 - 1 = 7.2$	21%
Enter Solve for	10 N	7.21% I/Y	PV \$55,653.98	\$8,000 PMT	FV
Enter Solve for	4 N	14.93% I/Y	PV \$31,893.27	РМТ	\$55,653.98 FV
Enter Solve for	6 N	14.93% I/Y	PV \$24,143.51	РМТ	\$55,653.98 FV
Enter Solve for	9 N	14.93% I/Y	PV \$15,902.03	РМТ	\$55,653.98 FV
56. <i>a</i> . Enter Solve for	6 N	10.5% I/Y	PV \$2,038.79	\$475 PMT	FV

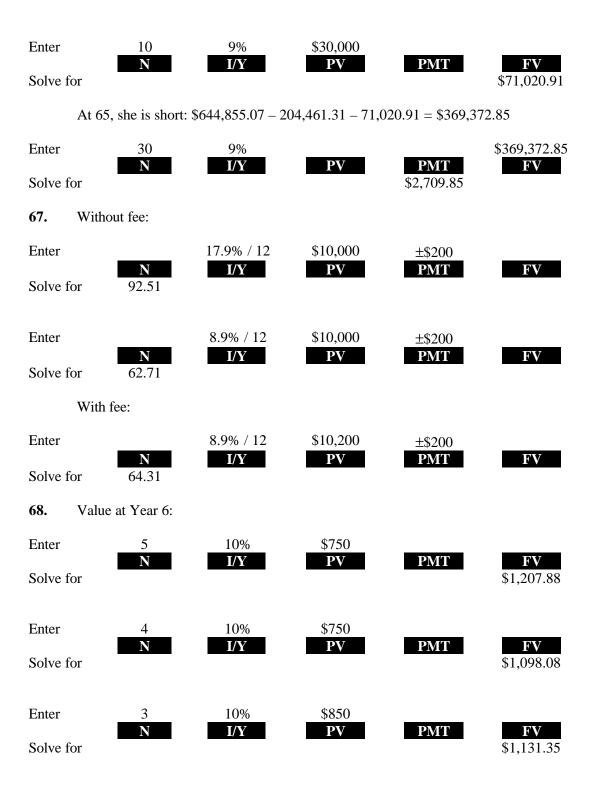
B-62 SOLUTIONS

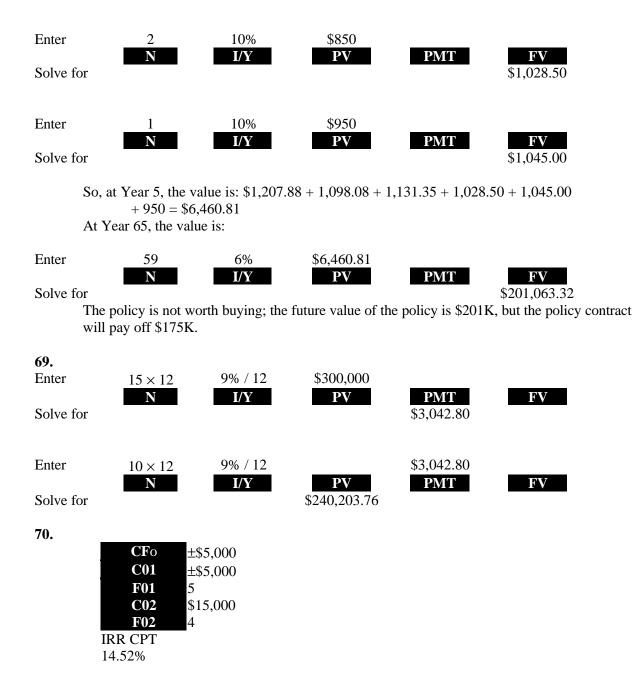
2 nd BGN 2 nd SET				
b. Enter 6	10.5%		\$475	
N Solve for	I/Y	PV \$2,252.86	PMT	FV
57. 2^{nd} BGN 2^{nd} SET	1			
Enter 48	9.25% / 12	\$48,000		
N Solve for	I/Y	PV	PMT \$1,191.01	FV
60. Enter 1		\$17,800		±\$20,000
Solve for	I/Y	PV	PMT	FV
Solve for	12.36%			
61. Enter 1		\$10,920		±\$13,000
N Solve for	I/Y 19.05%	PV	PMT	FV
62.				
Enter 1		\$9,700		±\$11,200
N Solve for	I/Y 15.46%	PV	PMT	FV
63.		\$0.02		101 14
Enter 1	I/Y	\$0.98 PV	PMT	±\$1.14 FV
Solve for	16.33%			

64. Refundable fee: With the \$1,000 application fee, you will need to borrow \$151,000 to have \$150,000 after deducting the fee. Solve for the payment under these circumstances.









B-66 SOLUTIONS

Solve for

74. The value at t = 7: \$50,000 Enter 7 13% I/Y Ν PV PMT FV Solve for \$117,630.27 2nd BGN 2nd SET Enter 10 13% \$117,630.27 N I/Y ΡV PMT FV Solve for \$19,184.10 75. $APR = 11\% \times 52 = 572\%$ а. 52 Enter 572% NOM C/Y I DI DI DI DI Solve for 22,640.23% b. \$0.89 Enter 1 ±\$1.00 \mathbf{N} PV PMT I/Y Solve for 12.36% $APR = 12.36\% \times 52 = 642.70\%$ Enter 642.70% 52 NOM C/Y 0 0 0 Solve for 42,727.20% с. Enter \$63.95 4 ±\$25 FV PV N PMT I/YSolve for 20.63% $APR = 20.63\% \times 52 = 1,072.90\%$ Enter 1,072.90% 52 NOM **B**FFF C/Y

1,722,530.00%