6.2 For an investment that doubles every 6 months when interest is compounded semiannually, the effective rate of return per 6-months is 100%. Therefore, the nominal return per year is 2*100 = 200%.

6.4 Amount due after 1 month = $300,000(1.007) = $302,100
Balance after $50,000 payment = 302,100 – 50,000
= $252,100

6.5 Solve equation by trial and error or Excel:

0 = -$50,000 + $15,000(P/A,i,4) + $9,000(P/F,i,4)

Try i = 12%: -$50,000 + $15,000(3.0373) + $9000(0.6355) = $1279 i too low
Try i = 14%: -$50,000 + $15,000(2.9137) + $9,000(0.5921) = $(965.60) i too high

By interpolation, i = 12% + $1,279/($1,279 – (-$965)) x 2% = 13.14%

EXCEL:

	A	B	C	D	E
Row 1	-50000	15000	15000	15000	24000

=IRR(A1:E1,.1) = 13.1223%
CFs, guess i

6.9 0 = -65,220(P/A,i,4) + (57,925 – 35,220)(P/A,i,31)(P/F,i,4)
0 = -65,220(P/A,i,4) + (22,705)(P/A,i,31)(P/F,i,4)

Solve by trial and error:
Try 6%: 0 = -225,994 + 250,510 = $24,516 i too low
Try 7%: 0 = -220,913 + 217,071 = ($3842) i too high

i = 6% + $24,516/($24,516 – (-$3,8420)) x 1 = 6.8645% per year (interpolation)

i = IRR(A1:AI1,.1) = 6.8508% per year (spreadsheet)
35 CF values, guess i

6.19 The alternative with the higher rate of return may not be the best alternative when the initial investment is less than the total money available for investment. In some cases, the *weighted average ROR* on the *total* amount available for investment can be higher when the lower ROR alternative is selected.

6.37

(a) Initial cost Machine 1:
-$60,000 – (-x) = -$16,000; therefore x = -$60,000 - (-$16,000) = -$44,000.
Overall ROR Machine 2: 0 = -$60,000 + $16,000(P/A,i*,10)

	A	B	C	D	E	F	G	H	I	J	k
Row 1	-60000	16000	16000	16000	16000	16000	16000	16000	16000	16000	16000

i* = IRR(A1:K1,.1) = 23.4131%

Incremental investment 3:2: -72,000 – (-60,000) = -$12,000
Incremental cash flow 4:3: 24,000 – 19,000 = $5000
Incremental ROR 3:2: 0 = -12,000 + 3000(P/A,i*,10) i* = 21.4%
Incremental ROR 4:3: 0 = -26,000 + 5000(P/A,i*,10) i* = 14.1%

(b) Machines are ranked according to initial investment cost;
Compare 2 vs 1: ROR = 35.7% > MARR eliminate 1
Compare 2 vs 3: ROR = 21.4% > MARR eliminate 2
Compare 3 vs 4: ROR = 14% > MARR keep 3

Select Machine 3

6.45 (a) one (b) three (c) seven