Chapter 3

3.8 $P = (20 - 8) + (20 - 8)(P/A,10\%,3) + (30 - 12)(P/A,10\%,5)(P/F,10\%,3)$
$+ (30 - 25)(P/F,10\%,9)$
$= 12 + 12(2.4869) + 18(3.7908)(0.7513) + 5(0.4241)$
$= \$95,228$

3.9 $2,000,000 = x(P/F,10\%,1) + 2x(P/F,10\%,2) + 4x(P/F,10\%,3) + 8x(P/F,10\%,4)$
$2,000,000 = x(0.9091) + 2x(0.8264) + 4x(0.7513) + 8x(0.6830)$
$11.0311x = 2,000,000$
$x = \$181,306$ (first payment)

3.13 (a) $A = 8000(A/P,10\%,9) + 4000 + (5000 - 4000)(F/A,10\%,4)(A/F,10\%,9)$
$= 8000(0.17364) + 4000 + (5000 - 4000)(4.6410)(0.07364)$
$= \$5731$ per year

(b) Enter cash flows in, say, column B, rows 2 through 11, and use the embedded function $= - PMT(10\%,9,NPV(10\%,B3:B11) + B2)$ to display \$5731.

3.18 $A = -2500(A/P,10\%,10) + (700 - 200)(P/A,10\%,4)(A/P,10\%,10)$
$+ (2000 - 300)(F/A,10\%,6)(A/F,10\%,10)$
$= -2500(0.16275) + 500(3.1699)(0.16275) + 1700(7.7156)(0.06275)$
$= \$674.14$ per year

3.29 Find F in year 5, subtract future worth of \$42,000, and then use A/F factor.

$F = 74,000(F/A,10\%,5) - 42,000(F/P,10\%,4)$
$= 74,000(6.1051) - 42,000(1.4641)$
$= \$390,285$

$A = 390,285(A/F,10\%,4)$
$= 390,285(0.21547)$
$= \$84,095$ per year

3.32 (a) Amount, year 9 $= -70,000(F/P,12\%,9) - 4000(F/A,12\%,6)(F/P,12\%,3)$
$+14,000(F/A,12\%,3) + 19,000(P/A,12\%,7)$
$= -70,000(2.7731) - 4000(8.1152)(1.4049) + 14,000(3.3744)$
$+ 19,000(4.5638)$
$= \$-105,767$

(b) Enter all cash flows in cells B2 through B18 and use the embeded function $= -FV(12\%,9,,NPV(12\%,B3:B18) + B2)$ to display \$-105,768.

3.44 Two ways to approach solution: Find P_g in year -1 and the move it forward to year 0; or handle initial \$3 million separately and start gradient in year 1. Using the former method and \$1 million units,

$$P_{g,-1} = 3\{1 - [(1 + 0.12)/(1 + 0.15)]^{11}\}/(0.15 - 0.12)$$
$$= 3\{1 - 0.74769\}/0.03$$
$$= \$25.2309$$

$$P_0 = 25.2309\ (F/P,15\%,1)$$
$$= 25.2309\ (1.15)$$
$$= \$29.0156 \qquad (\$29{,}015{,}600)$$

3.50 $P_1 = 470(P/A,10\%,6) - 50(P/G,10\%,6) + 470(P/F,10\%,7)$
$= 470(4.3553) - 50(9.6842) + 470(0.5132)$
$= \$1803.99$

$F = 1803.99(F/P,10\%,7)$
$= 1803.99(1.9487)$
$= \$3515$

3.56 Answer is (b)

3.62 $A = 2{,}000{,}000(A/F,10\%,5) = 2{,}000{,}000(0.16380)$
$= \$327{,}600$

Answer is (b)