# Chapter 2

**2.23** Interpolated value: Interpolate between n = 40 and n = 45:

$$3/5 = x/(72.8905 - 45.2593)$$
$$x = 16.5787$$

$$(F/P,10\%,43) = 45.2593 + 16.5787$$
$$= 61.8380$$

Formula value: $(F/P,10\%,43) = (1+ 0.10)^{43} - 1 = 59.2401$

% difference = $[(61.8380 - 59.2401)/ 59.2401]*100 = 4.4\%$

**2.29** (a) $CF_3 = 70 + 3(4) = \$82$ ($82,000)

(b) $P = 74(P/A,10\%,10) + 4(P/G,10\%,10)$
$= 74(6.1446) + 4(22.8913)$
$= \$546.266$ ($546,266)

$F = 546.266(F/P,10\%,10)$
$= 521.687(2.5937)$
$= \$1416.850$ ($1,416,850)

**2.31** $P = 2.1B\ (P/F,18\%,5)$
$= 2.1B\ (0.4371)$
$= \$917,910,000$

$917,910,000 = 50,000,000(P/A,18\%,5) + G(P/G,18\%,5)$
$917,910,000 = 50,000,000(3.1272) + G(5.2312)$
$G = \$14,557,845$

**2.33** First find $P_g$ (using equation) and then convert to A

For n = 1: $P_g = \{1 - [(1 + 0.04)/(1 + 0.10)]^1\}/(0.10 - 0.04)$
$= 0.90909$

$A = 0.90909(A/P,10\%,1)$
$= 0.90909(1.1000)$
$= 1.0000$

**2.35** $P_{g1} = 10,000\{1 - [(1 + 0.04)/(1 + 0.08)]^{10}\}/(0.08 - 0.04)$
$= \$78,590$

$P_{g2} = 10,000\{1 - [(1 + 0.06)/(1 + 0.08)]^{11}\}/(0.08 - 0.06)$
$= \$92,926$

Difference = $14,336

**2.39** $813{,}000 = 170{,}000(F/P,i,15)$
$813{,}000 = 170{,}000(1 + i)^{15}$

$\log 4.78235 = (15)\log (1 + i)$
$0.6796/15 = \log (1 + i)$
$\log (1 + i) = 0.04531$

$1 + i = 1.11$
$i = 11\%$ per year

Can be solved using the RATE function = RATE(15,,-170000,813000).

**2.42** $800{,}000 = 250{,}000(P/A,i,5)$
$(P/A,i,5) = 3.20$

Interpolate between 16% and 18% interest tables or use a spreadsheet. By spreadsheet function, $i = 16.99\% \approx 17\%$ per year.

**2.44** $48{,}436 = 42{,}000 + 4000(A/G,i,5)$
$6436 = 4000(A/G,i,5)$
$(A/G,i,5) = 1.6090$

For n = 5 in A/G column, value of 1.6090 is in 22% interest table.

**2.46** Starting amount = $1{,}600{,}000(0.55) = \$880{,}000$

$1{,}600{,}000 = 880{,}000(F/P,9\%,n)$
$(F/P,9\%,n) = 1.8182$

Interpolate in 9% interest table or use the spreadsheet function
= NPER(9%,,-880000,1600000) to determine that $n = 6.94 \approx 7$ years.

**2.49** $350{,}000 = 15{,}000(P/A,4\%,n) + 21{,}700(P/G,4\%,n)$

Solve by trial and error in 4% interest table between 5 and 6 years to determine
$n \approx 6$ years

**2.51** $140(0.06 - 0.03) = 12\{1 - [(0.97170)]^x\}$
$4.2/12 = 1 - [0.97170]^x$
$0.35 - 1 = -[0.97170]^x$
$0.65 = [0.97170]^x$

$\log 0.65 = (x)(\log 0.97170)$
$x = 15$ years