

FIGURE 2.1

```

Option Explicit                                line 1

Public Sub Get_Annuity()                      line 2
    Dim Future_Value As Double                line 3
    Dim Interest_Rate As Double               line 4
    Dim n_Periods As Integer                  line 5
    Dim A_A As Double                         line 6

    Future_Value = Sheet1.Cells(2, 2)         line 7
    Interest_Rate = Sheet1.Cells(3, 2)        line 8
    n_Periods = Sheet1.Cells(4, 2)            line 9
    A_A = Future_Value * (Interest_Rate / ((1 + Interest_Rate) ^ n_Periods - 1)) line 10
    Sheet1.Cells(8, 2) = A_A                  line 11

    Dim Payment As Double                     line 12
    Dim Future_Value_Interest() As Double     line 13
    Dim Future_Value_Annuity_Payout() As Double line 14
    ReDim Future_Value_Interest(n_Periods + 1) As Double line 15
    ReDim Future_Value_Annuity_Payout(n_Periods + 1) As Double line 16

    Payment = A_A                             line 17

    Future_Value_Annuity_Payout(0) = 0.0#      line 18
    Dim i As Integer                          line 19
    For i = 1 To n_Periods                    line 20
        Future_Value_Interest(i) = Future_Value_Annuity_Payout(i - 1) _ line 21
            * Interest_Rate

        Future_Value_Annuity_Payout(i) = Future_Value_Annuity_Payout(i - 1) _ line 22
            + Future_Value_Interest(i) + Payment

        Sheet1.Cells(i + 9, 9) = Future_Value_Interest(i) line 23
        Sheet1.Cells(i + 9, 10) = Future_Value_Annuity_Payout(i) line 24

    Next i                                    line 25
End Sub                                       line 26

```

FIGURE 2.10

```

Option Explicit                                     line 1

Public Sub Get_Annuity()                             line 2
    Dim Future_Value As Double                       line 3
    Dim Interest_Rate As Double                     line 4
    Dim n_Periods As Integer                         line 5
    Dim A_A As Double                               line 6

    Future_Value = Sheet1.Cells(2, 2)                line 7
    Interest_Rate = Sheet1.Cells(3, 2)                line 8
    n_Periods = Sheet1.Cells(4, 2)                   line 9
    A_A = Future_Value * (Interest_Rate / ((1 + Interest_Rate) ^ n_Periods - 1)) line 10
    Sheet1.Cells(8, 2) = A_A                          line 11

    Dim Payment As Double                           line 12
    Dim Future_Value_Interest() As Double            line 13
    Dim Future_Value_Annuity_Payout() As Double      line 14
    ReDim Future_Value_Interest(n_Periods + 1)       line 15
    ReDim Future_Value_Annuity_Payout(n_Periods + 1) line 16

    Payment = A_A                                     line 17

    Call Annuity_Payout(Interest_Rate, n_Periods, Payment, _
        Future_Value_Interest, Future_Value_Annuity_Payout) line 18

    Dim i As Integer                                line 19
    For i = 1 To 240                                 line 20

        Sheet1.Cells(i + 9, 9) = Future_Value_Interest(i) line 21
        Sheet1.Cells(i + 9, 10) = Future_Value_Annuity_Payout(i) line 22
    Next i                                             line 23

End Sub                                              line 24

Sub Annuity_Payout(I_R, n_P, P, F_V_I, F_V_A_P)      line 25

    F_V_A_P(0) = 0.0#                                line 26
    Dim i As Integer                                line 27
    For i = 1 To n_P                                  line 28
        F_V_I(i) = F_V_A_P(i - 1) * I_R              line 29
        F_V_A_P(i) = F_V_A_P(i - 1) + F_V_I(i) + P    line 30
    Next i                                             line 31
End Sub                                              line 32

```

(a)

For / Next: The general construction is,

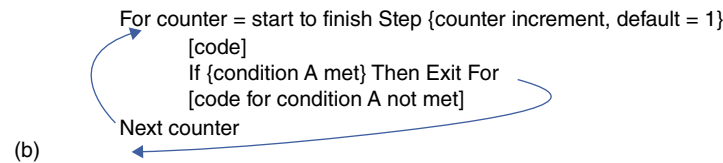


FIGURE 2.11

Option Explicit	line 1
Public Sub Get_Annuity()	line 2
Dim Future_Value As Double	line 3
Dim Interest_Rate As Double	line 4
Dim n_Periods As Integer	line 5
Dim A_A As Double	line 6
Future_Value = Sheet1.Cells(2, 2)	line 7
Interest_Rate = Sheet1.Cells(3, 2)	line 8
n_Periods = Sheet1.Cells(4, 2)	line 9
A_A = A_A_Calc(Future_Value, Interest_Rate, n_Periods)	line 10
Sheet1.Cells(8, 2) = A_A	line 11
End Sub	line 12
Public Function A_A_Calc(Future_Value, Interest_Rate, n) As Double	line 13
A_A_Calc = Future_Value * (Interest_Rate / ((1 + Interest_Rate) ^ n - 1))	line 14
End Function	line 15

FIGURE 2.12

```

Option Explicit                                                    line 1

Public Sub Get_Annuity()                                           line 2
    Dim Future_Value As Double                                     line 3
    Dim Interest_Rate As Double                                    line 4
    Dim n_Periods As Integer                                       line 5
    Dim A_A As Double                                              line 6

    Future_Value = Sheet1.Cells(2, 2)                             line 7
    Interest_Rate = Sheet1.Cells(3, 2)                             line 8
    n_Periods = Sheet1.Cells(4, 2)                                 line 9
    A_A = Future_Value * (Interest_Rate / ((1 + Interest_Rate) ^ n_Periods - 1))
                                                                    line 10
    Sheet1.Cells(8, 2) = A_A                                       line 11

    Dim Payment As Double                                          line 12
    Dim Matrix_Interest_Annuity_Payout() As Double                line 13
    ReDim Matrix_Interest_Annuity_Payout(n_Periods + 1, 2)        line 14

    Payment = A_A                                                  line 15

    Call Annuity_Payout(Interest_Rate, n_Periods, Payment, _
        Matrix_Interest_Annuity_Payout)                           line 16

    Dim i As Integer                                               line 17
    For i = 1 To 240                                                line 18

        Sheet1.Cells(i + 9, 9) = Matrix_Interest_Annuity_Payout(i, 0) line 19
        Sheet1.Cells(i + 9, 10) = Matrix_Interest_Annuity_Payout(i, 1) line 20
    Next i                                                         line 21

End Sub                                                            line 22

Sub Annuity_Payout(I_R, n_P, P, M_I_A_P)                          line 23

    M_I_A_P(0, 1) = 0.0#                                          line 24
    Dim i As Integer                                              line 25

    For i = 1 To n_P                                              line 26

        M_I_A_P(i, 0) = M_I_A_P(i - 1, 1) * I_R                line 27
        M_I_A_P(i, 1) = M_I_A_P(i - 1, 1) + M_I_A_P(i, 0) + P   line 28

    Next i                                                         line 29

End Sub                                                            line 30

```

FIGURE 2.13

Interest_Rate		0.0272775402996239					
	A	B	C	D	E	F	G
1							
2	Example 2.12						
3							
4							
5							
6		Interest Rate	0.0272775402996239	<--Vary			
7							
8							
9					Cash	Present	
10			Year	Flow	Value		
11			0	=-3	=E11/(1+Interest_Rate)*D11		
12			1	=0.9-0.25	=E12/(1+Interest_Rate)*D12		
13			2	=0.9-0.25	=E13/(1+Interest_Rate)*D13		
14			3	=0.9-0.25	=E14/(1+Interest_Rate)*D14		
15			4	=0.9-0.25	=E15/(1+Interest_Rate)*D15		
16			5	=0.9-0.25	=E16/(1+Interest_Rate)*D16		
17							
18				Sum PV->	=SUM(F11:F16)		Goal Seek

(a)

	A	B	C	D	E	F	G
1							
2	Example 2.12						
3							
4							
5							
6		Interest Rate	0.0273	<--Vary			
7							
8							
9					Cash	Present	
10			Year	Flow	Value		
11			0	-3.00	-3.00		
12			1	0.65	0.63		
13			2	0.65	0.62		
14			3	0.65	0.60		
15			4	0.65	0.58		
16			5	0.65	0.57		
17							
18				Sum PV->	0.00		Goal Seek
19							
20							
21							
22							
23							
24							
25							
26							

Goal Seek

Set cell:

To value:

By changing cell:

OK Cancel

(b)

FIGURE 2.14

	A	B	C	D	E	F	G	H	I	J
1	Example 2.14									
2										
3		25	Fixed Capital Investment							
4		2.5	Start Up							
5		5	Working Capital							
6		0	Salvage	0.21	MARR					
7		45	Annual Revenue							
8		30	Operating Costs							
9	3.928571	S.L. Dep								
10	0.4	Tax Rate								
11										
12										
13	Year	BTCF	Deprec	TaxInc	Tax	ATCF		PV ATCF		
14	-2	-12.5			0	-12.50		-18.3013		
15	-1	-12.5			0	-12.50		-15.125		
16	0	-7.5			0	-7.50		-7.5		
17	1	15.00	3.928571	11.07	4.428571	10.57		8.736718		
18	2	15.00	3.928571	11.07	4.428571	10.57		7.220428		
19	3	15.00	3.928571	11.07	4.428571	10.57		5.967296		
20	4	15.00	3.928571	11.07	4.428571	10.57		4.931649		
21	5	15.00	3.928571	11.07	4.428571	10.57		4.075743		
22	6	15.00	3.928571	11.07	4.428571	10.57		3.368383		
23	7	15.00	3.928571	11.07	4.428571	10.57		2.783788		
24	8	15.00		15.00	6	9.00		1.958662		
25	9	15.00		15.00	6	9.00		1.618729		
26	10	20.00		15.00	6	14.00		2.081011		
27										
28							Sum	1.82	Present Value	
29										
30							IRR	0.22	Goal Seek	
31									Set Sum =0	
32									Vary MARR	

FIGURE 2.15

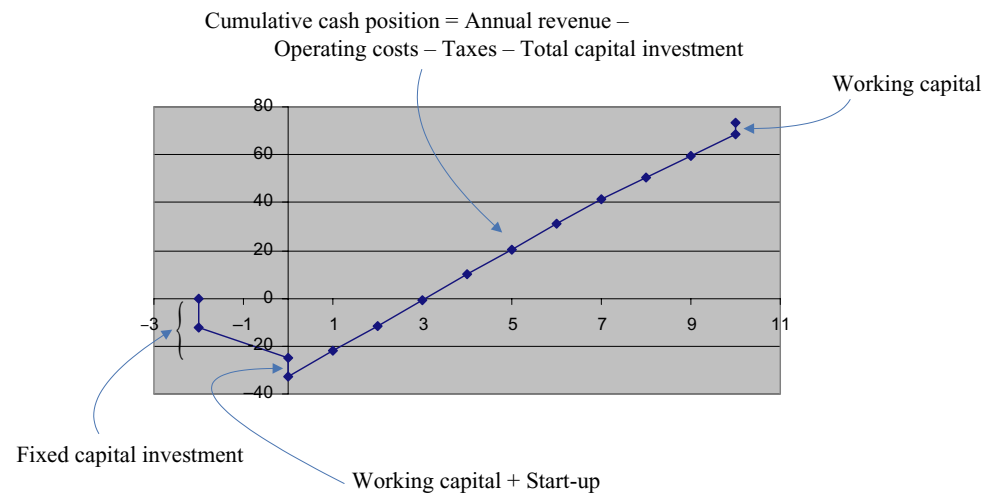


FIGURE 2.16

	A	B	C	D	E	F	G
1	Profit Start.xls						
2					Scenarios		
3					Low	High	Average
4				Probability	50%	50%	
5	Sales in Units	80000		Units	60000	100000	80000
6	Price per Unit	9		Price	10	8	9
7	Unit Cost	7.5					
8	Fixed Costs	30000		Unit Cost			
9				Low	Likely	High	Average
10	Profit	90000		6	7.5	9	7.5
11							
12		Profit = Sales * (Price - Unit_Cost) - Fixed_Cost					

FIGURE 2.17

	A	B	C	D	E	F	G
1	Profit ND VBA.xls						
2					Scenarios		
3	Financials				Low	High	Average
4				Prob	50%	50%	
5	Sales in Units	100000		Units	60000	100000	80000
6	Price per Unit	8		Price	10	8	9
7	Unit Cost	7.263025546					
8	Fixed Costs	30000		Unit Cost			
9				Low	Likely	High	Average
10	Profit	43697.45		6	7.5	9	7.5
11							
12							
13	Counter	1000		Random Number Generation			
14				0.779534		0.317768	
15							
16		Histogram %					
17	Profit >= \$150,000	6.80					
18	Profit >= \$100,000 but < \$150,000	34.20					
19	Profit >= \$50,000 but < \$100,000	21.50					
20	Profit >= \$0 but < \$50,000	18.30					
21	Profit >= -\$50,000 but < \$0	13.90					
22	Profit >= -\$100,000 but < -\$50,000	4.60					
23	Profit <= -\$100,000	0.70					

FIGURE 2.18

```

Option Explicit
Public Sub Run_Simulation()

    Dim i As Integer
    Dim HistA As Double, HistB As Double, HistC As Double
    Dim HistD As Double, HistE As Double, HistF As Double
    Dim HistG As Double
    HistA = 0.0#
    HistB = 0.0#
    HistC = 0.0#
    HistD = 0.0#
    HistE = 0.0#
    HistF = 0.0#
    HistG = 0.0#

    For i = 1 To 1000
        Dim Profit As Double

        ' We must make a change on the sheet to have the sheet calculate
        Sheet1.Cells(13, 2) = i

        Profit = Sheet1.Cells(10, 2)

        If Profit >= 150000 Then
            HistA = HistA + 1
        ElseIf Profit >= 100000 Then HistB = HistB + 1
        ElseIf Profit >= 50000 Then HistC = HistC + 1
        ElseIf Profit >= 0 Then HistD = HistD + 1
        ElseIf Profit >= -50000 Then HistE = HistE + 1
        ElseIf Profit >= -100000 Then HistF = HistF + 1
        Else : HistG = HistG + 1
        End If
    Next i

    ' Remember i is now one more than counter limit in For statement
    Sheet1.Cells(17, 2) = (HistA / (i - 1)) * 100
    Sheet1.Cells(18, 2) = (HistB / (i - 1)) * 100
    Sheet1.Cells(19, 2) = (HistC / (i - 1)) * 100
    Sheet1.Cells(20, 2) = (HistD / (i - 1)) * 100
    Sheet1.Cells(21, 2) = (HistE / (i - 1)) * 100
    Sheet1.Cells(22, 2) = (HistF / (i - 1)) * 100
    Sheet1.Cells(23, 2) = (HistG / (i - 1)) * 100
End Sub

```

FIGURE 2.19

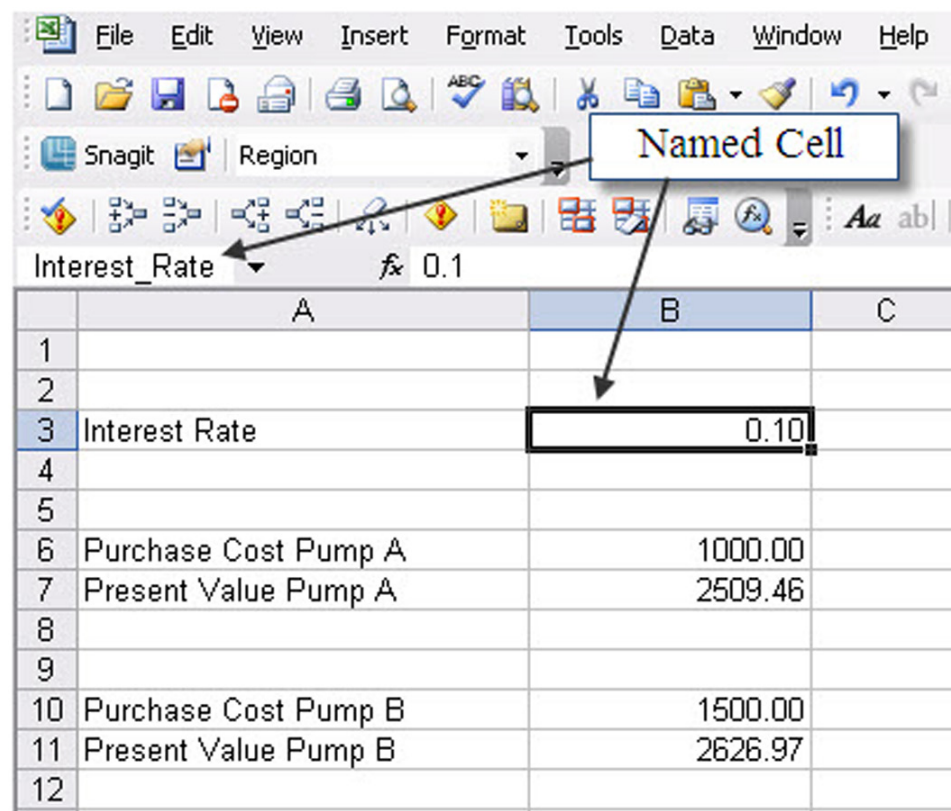


FIGURE 2.2

	A	B	C	D	E	F	G	H	I	J	K
1	Profit TD VBA.xls										
2					Scenarios						
3	Financials				Low	High	Average				
4				Prob	50%	50%					
5	Sales in Units	100000		Units	60000	100000	80000				
6	Price per Unit	8		Price	10	8	9				
7	Unit Cost	6.550273033									
8	Fixed Costs	30000		Unit Cost					0.5	(b-a)/(d-a)	
9				Low (a)	Likely (b)	High (d)	Average				
10	Profit	114972.70		6	7.5	9	7.5		6.550273	0 <= RN <= (b-a)/(d-a)	
11									6.951293	(b-a)/(d-a) < RN <= 1	
12											
13	Counter	1000		Random Number Generation							
14				0.885662		0.067289					
15											
16		Histogram %									
17	Profit >= \$150,000	9.80									
18	Profit >= \$100,000 but < \$150,000	29.60									
19	Profit >= \$50,000 but < \$100,000	26.00									
20	Profit >= \$0 but < \$50,000	17.10									
21	Profit >= -\$50,000 but < \$0	10.60									
22	Profit >= -\$100,000 but < -\$50,000	5.50									
23	Profit <= -\$100,000	1.40									

FIGURE 2.20

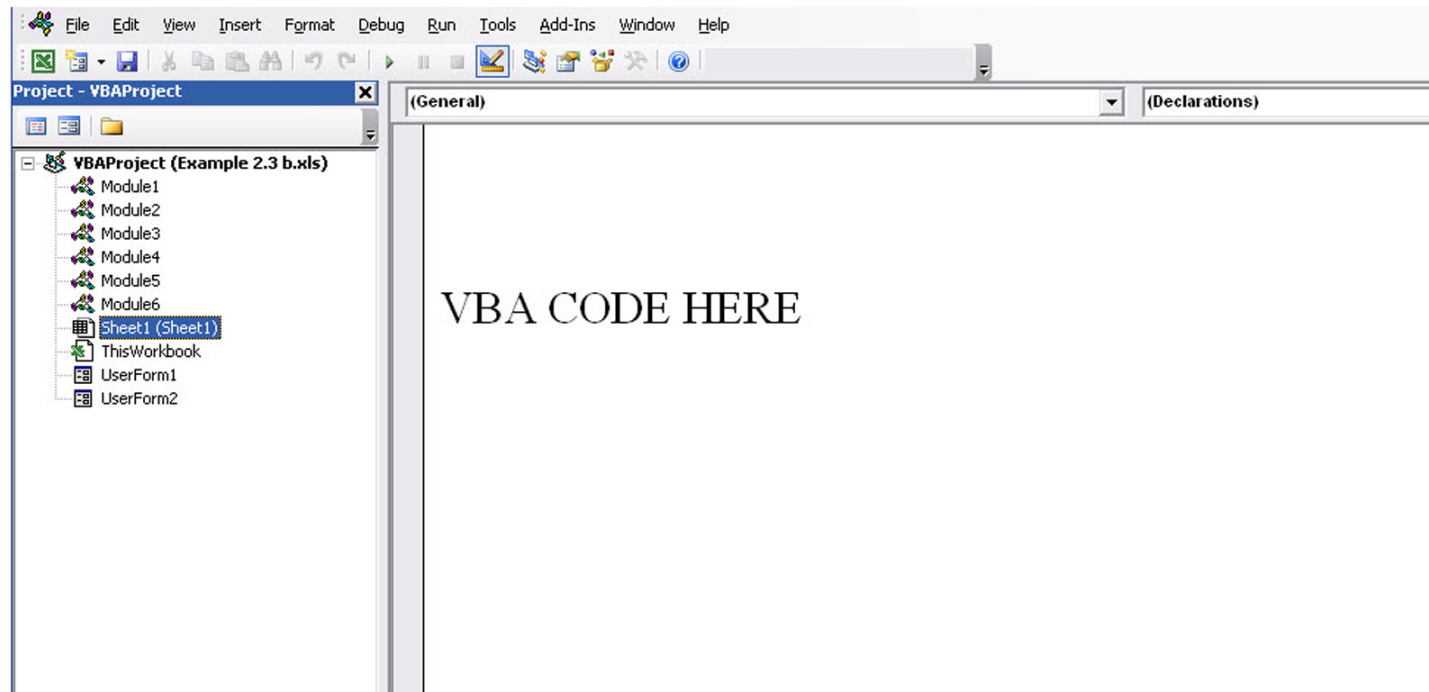


FIGURE 2.4

Option Explicit	line 1
Public Sub Calc_PV()	line 2
' Dimension and declare variable type	line 3
Dim Cost_Pump_A As Double	line 4
Dim Cost_Pump_B As Double	line 5
Dim Interest_Rate As Double	line 6
Dim PV_Pump_A As Double	line 7
Dim PV_Pump_B As Double	line 8
'Read data from sheet	line 9
Cost_Pump_A = Sheet1.Cells(6, 2)	line 10
Cost_Pump_B = Sheet1.Cells(10, 2)	line 11
Interest_Rate = Sheet1.Cells(3, 2)	line 12
'Calculate Present Values	
'A line break or contiuation requires the use of underscore _	
'	line 13
PV_Pump_A = Cost_Pump_A + Cost_Pump_A / (1 + Interest_Rate) ^ 2 _	
+ Cost_Pump_A / (1 + Interest_Rate) ^ 4	line 14
PV_Pump_B = Cost_Pump_B + Cost_Pump_B / (1 + Interest_Rate) ^ 3	line 15
'Write Present Values to sheet	line 16
Sheet1.Cells(7, 4) = PV_Pump_A	line 17
Sheet1.Cells(11, 4) = PV_Pump_B	line 18
End Sub	line 19

FIGURE 2.5

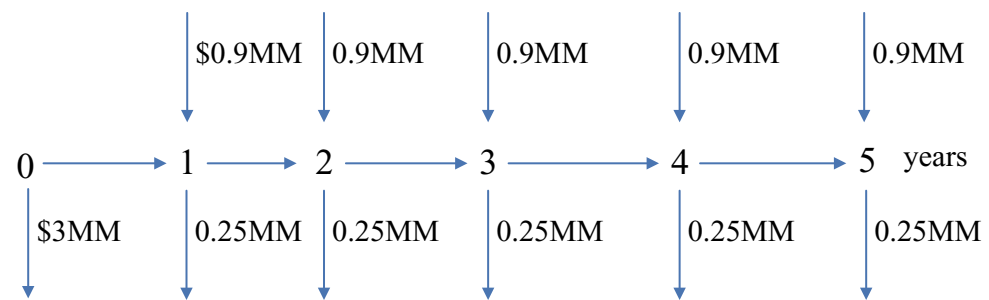


FIGURE 2.6

Option Explicit	line 1
Public Function Annuity_PV(Annuity, Interest_Rate, n)	line 2
'Calculate Present Value of the Annuity	
'A line break or continuation requires the use of underscore _	
'	line 3
Annuity_PV = Annuity * ((1 + Interest_Rate) ^ n - 1) _	
/ ((Interest_Rate) * ((1 + Interest_Rate) ^ n))	line 4
End Function	line 5

FIGURE 2.7

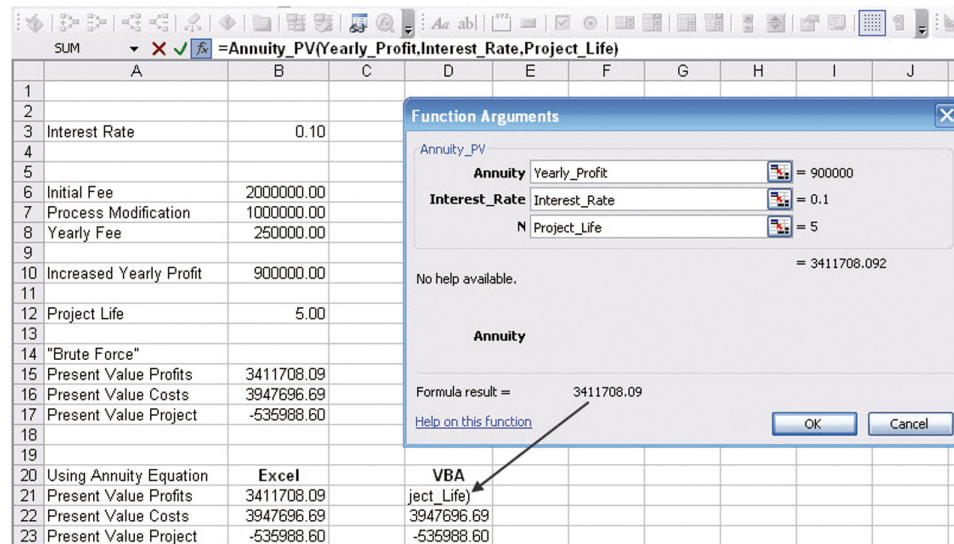


FIGURE 2.8

	A	B	C	D	E	F	G	H
1	Example 2.6							
2	Future Value	500000						
3	Interest Rate	0.008333333						
4	Period	240						
5								
6	Annuity Excel	658.4415587						
7							Future Value	
8								
9				Month	Payment	Interest	Available	
10				1	658.4416	0	658.4416	
11				2	658.4416	5.487013	1322.37	
12				3	658.4416	11.01975	1991.831	
13				4	658.4416	16.5986	2666.872	
14				5	658.4416	22.22393	3347.537	
15				6	658.4416	27.89614	4033.875	
16				7	658.4416	33.61562	4725.932	
17				8	658.4416	39.38277	5423.756	
18				9	658.4416	45.19797	6127.396	
19				10	658.4416	51.06163	6836.899	
20				11	658.4416	56.97416	7552.315	
21				12	658.4416	62.93596	8273.692	
22				13	658.4416	68.94744	9001.081	
23				14	658.4416	75.00901	9734.532	
243				234	658.4416	3894.354	471875.3	
244				235	658.4416	3932.294	476466.1	
245				236	658.4416	3970.551	481095.1	
246				237	658.4416	4009.125	485762.6	
247				238	658.4416	4048.022	490469.1	
248				239	658.4416	4087.242	495214.8	
249				240	658.4416	4126.79	500000	

= D10 + 1

= \$B\$6

=G10 * Interest_Rate

= E11 + F11++G10

FIGURE 2.9

```

Option Explicit

Public Sub Simple_Addition()
Dim x As Double
Dim y As Double
Dim z As Double

'By Reference
x = 1
y = 2
z = 0
Call Add_1(x, y, z)
Sheet1.Cells(2, 2) = x
Sheet1.Cells(3, 2) = y
Sheet1.Cells(4, 2) = z

'By Value Method 1
x = 1
y = 2
z = 0
Call Add_1((x), (y), (z))
Sheet1.Cells(2, 6) = x
Sheet1.Cells(3, 6) = y
Sheet1.Cells(4, 6) = z

'By Value Method 2
x = 1
y = 2
z = 0

Call Add_2(x, y, z)
Sheet1.Cells(2, 8) = x
Sheet1.Cells(3, 8) = y
Sheet1.Cells(4, 8) = z
End Sub

Sub Add_1(a, b, c)
c = a + b
End Sub

Sub Add_2(ByVal a, ByVal b, ByVal c)
c = a + b
End Sub

```

FIGURE p2.6