

	A	B	C	D	E	F	G	H
1	[Student Name]							
2	Spreadsheet Problem 1: Time Value of Money (Retirement Savings)							
3								
4	Exercise involves someone who plans to deposit regular annual amounts into a retirement savings plan such as a Roth Individual							
5	Retirement Account (IRA). The deposits will increase in stages over time (with different levels in years 1-6, 7-30, and 31-40).							
6	He/she will make deposits on each birthday for 40 years (for example 25 through 65), and then retire one year after the last deposit							
7	is made (so interest will be earned on all deposits, including the final one).							
8								
9	INPUT SECTION							
10	Amount Deposited at Beginning of Each of Years 1 - 6				\$3,100.00			
11	Amount Deposited at Beginning of Each of Years 7 - 30				\$4,200.00			
12	Amount Deposited at Beginning of Each of Years 31 - 40				\$5,300.00			
13	Expected Average Annual After-Tax Rate of Return				4.35%			
14	Expected Number of Deposits				40			
15	Age When First Deposit Is Made				25			
16								
17	OUTPUT SECTION							
18	First, compute the expected total by finding the amount to which each individual deposit will grow by the retirement date (in Column F							
19	below). Then get the same total by adding the compounded values for the groups of related deposits (in Column G below).							
20								
21		Age at	Remaining			Value of	Sum of Values of	
22		Beginning	Years Until	Annual	Future Value	Deposit at	Equal Deposits at	
23	Year	of Year	Retirement	Deposit	Factor	Retirement	Retirement	
24	1	25	40	\$3,100.00	5.491590	\$17,023.93		
25	2	26	39	\$3,100.00	5.262664	\$16,314.26		
26	3	27	38	\$3,100.00	5.043282	\$15,634.17		
27	4	28	37	\$3,100.00	4.833044	\$14,982.44		
28	5	29	36	\$3,100.00	4.631571	\$14,357.87		
29	6	30	35	\$3,100.00	4.438496	\$13,759.34	\$92,072.01	
30	7	31	34	\$4,200.00	4.253470	\$17,864.58		
31	8	32	33	\$4,200.00	4.076158	\$17,119.86		
32	9	33	32	\$4,200.00	3.906236	\$16,406.19		
33	10	34	31	\$4,200.00	3.743398	\$15,722.27		
34	11	35	30	\$4,200.00	3.587349	\$15,066.86		
35	12	36	29	\$4,200.00	3.437804	\$14,438.78		
36	13	37	28	\$4,200.00	3.294494	\$13,836.87		
37	14	38	27	\$4,200.00	3.157157	\$13,260.06		
38	15	39	26	\$4,200.00	3.025546	\$12,707.29		
39	16	40	25	\$4,200.00	2.899421	\$12,177.57		
40	17	41	24	\$4,200.00	2.778554	\$11,669.93		
41	18	42	23	\$4,200.00	2.662726	\$11,183.45		
42	19	43	22	\$4,200.00	2.551726	\$10,717.25		
43	20	44	21	\$4,200.00	2.445353	\$10,270.48		
44	21	45	20	\$4,200.00	2.343414	\$9,842.34		
45	22	46	19	\$4,200.00	2.245725	\$9,432.05		
46	23	47	18	\$4,200.00	2.152108	\$9,038.86		
47	24	48	17	\$4,200.00	2.062394	\$8,662.06		
48	25	49	16	\$4,200.00	1.976420	\$8,300.96		
49	26	50	15	\$4,200.00	1.894030	\$7,954.93		
50	27	51	14	\$4,200.00	1.815074	\$7,623.31		
51	28	52	13	\$4,200.00	1.739410	\$7,305.52		
52	29	53	12	\$4,200.00	1.666900	\$7,000.98		
53	30	54	11	\$4,200.00	1.597412	\$6,709.13	\$274,311.58	
54	31	55	10	\$5,300.00	1.530821	\$8,113.35		
55	32	56	9	\$5,300.00	1.467007	\$7,775.14		
56	33	57	8	\$5,300.00	1.405852	\$7,451.02		
57	34	58	7	\$5,300.00	1.347247	\$7,140.41		
58	35	59	6	\$5,300.00	1.291085	\$6,842.75		
59	36	60	5	\$5,300.00	1.237264	\$6,557.50		
60	37	61	4	\$5,300.00	1.185686	\$6,284.14		
61	38	62	3	\$5,300.00	1.136259	\$6,022.17		
62	39	63	2	\$5,300.00	1.088892	\$5,771.13		
63	40	64	1	\$5,300.00	1.043500	\$5,530.55	\$67,488.15	
64								
65					\$172,400.00		\$433,871.74	\$433,871.74
66					Total		Compounded	Compounded
67					Deposits		Value of	Value of
68						Individual Deposits	Grouped Deposits	
69								
70	Finally, compute the same total as the future value of a sequence of annuities (in Column H below):							
71							Compounded	
72							Compounding	"Truncated"
73				Annual Deposit	Annuity Factor	Factor	Annuity Factor	Value of
74	Future Value of Year 31-40 Annuity			\$5,300.00	12.733613	1.000000	12.73361299	\$67,488.15
75	Future Value of Year 7-30 Annuity			\$4,200.00	42.664859	1.530821	65.31228058	\$274,311.58
76	Future Value of Year 1 - 6 Annuity			\$3,100.00	6.982686	4.253470	29.70064823	\$92,072.01
77	Total Expected Balance at Retirement							\$433,871.74