



قد توجد بعض الأخطاء
التي مقصودها

اختبار محاكاة لامتحان نهاية الفصل الدراسي
الرياضة المالية ٢ - مال ٣١٦ (جداول الفوائد موجودة بعد الأسئلة)

إعداد: Sayed Mosawi

PART I: COMPOUND INTEREST

QUESTION (1):

Eman deposited BD23,000 in Ila Bank at 6% annually. If the interest is compounded thirdly. Calculate the following:

1. the amount in her account at her end of 6 years and 9 months.
2. Compound interest.

$$n = 6 + \frac{9}{12} = 6.75 \times 3 = 20.25$$

$$i = 6 \div 3 = 2\%$$

$$\begin{aligned} FV &= PV \times (1+i)^n \\ &= 23000 \times (1+2\%)^{20.25} \\ &= 23000 \times 1.4933 \\ &= \text{BD } 34,345.900 \end{aligned}$$

$$\begin{aligned} CI &= FV - PV \\ &= 34,345.9 - 23000 \\ &= \text{BD } 11,345.900 \end{aligned}$$

QUESTION (2):

Use the **interest tables** to find the compound interest of BD2550 borrowed for 95 years at an effective rate of 6.5% annually.

$$\begin{aligned} FV &= PV \times (1+i)^n \\ &= 2550 \times (1+6.5\%)^{50} \times (1+6.5\%)^{45} \\ &= 2550 \times 23.3067 \times 17.0111 \\ &= \text{BD } 1,011,055.141 \end{aligned}$$

50 ← 45

$$\begin{aligned} CI &= FV - PV \\ &= 1,011,055.141 - 2550 = \text{BD } 1,008,455.141 \end{aligned}$$

**QUESTION (3):**

Find the present value that generates interest of BD21,722 at 8% annually for 15 years.

$$CI = PV \times (1+i)^n - 1$$

$$21,722 = PV \times (1+8\%)^{15} - 1$$

$$21,722 = PV \times 2.1722$$

$$PV = \frac{21,722}{2.1722} = \text{BD } 10,000$$

QUESTION (4):

Mohamed borrowed BD90,000 in Al-Salam Bank that gives amount of BD161,181 at 10 years. Find the compound interest and the interest rate.

$$FV = PV \times (1+i)^n$$

$$161,181 = 90,000 \times (1+i)^{10}$$

$$(1+i)^{10} = 161,181 \div 90,000$$

$$= 1.7909$$

$$\sqrt[10]{1.7909} = (1.06 - 1) \times 100$$

$$i = 6\%$$



PART II: ANNUITIES

QUESTION (1):

Find the missing factors:

PMT	i	n	Future Value	Interest	Present Value
BD90	12%	8 years	?	?	?

A. Using Ordinary Annuity:

$$\begin{aligned}FV &= Pmt \times \frac{(1+i)^n - 1}{i} \\&= 90 \times \frac{(1+12\%)^8 - 1}{12\%} \\&= 90 \times 12.29969 = \text{BD } 1,106.972\end{aligned}$$

$$\begin{aligned}CI &= FV - (Pmt \times n) \\&= 1106.972 - (90 \times 8) = \text{BD } 386.972\end{aligned}$$

$$\begin{aligned}PV &= Pmt \times \frac{1 - (1+i)^{-n}}{i} \\&= 90 \times \frac{1 - (1+12\%)^{-8}}{12\%} \\&= 90 \times 4.96764 = \text{BD } 447.088\end{aligned}$$



$$\begin{aligned}
 \text{B. Using Annuity Due: } FU &= Pmt \times \frac{(1+i)^n - 1}{i} \times (1+i) \\
 &= 90 \times \frac{(1+12\%)^8 - 1}{12\%} \times (1+12\%) \\
 &= 90 \times 12.29969 \times (1.12) \\
 &= \text{BD } 1,239.809
 \end{aligned}$$

$$\begin{aligned}
 CI &= FU - (Pmt \times n) \\
 &= 1239.809 - (90 \times 8) = \text{BD } 519.809
 \end{aligned}$$

$$\begin{aligned}
 PV &= Pmt \times \frac{1 - (1+i)^{-n}}{i} \times (1+i) \\
 &= 90 \times \frac{1 - (1+12\%)^{-8}}{12\%} \times (1+12\%) \\
 &= 90 \times 4.96764 \times 1.12 \\
 &= \text{BD } 500.738
 \end{aligned}$$

QUESTION (2):

What is annually annuity paid at the beginning of each year, if the future value is BD23686.326 at 8% annually for 25 years.

$$FU = Pmt \times \frac{(1+i)^n - 1}{i} \times (1+i) \quad | \quad Pmt = \text{BD } 300$$

$$23,686.326 = Pmt \times \frac{(1+8\%)^{25} - 1}{8\%} \times (1+8\%)$$

$$23,686.326 = Pmt \times 73.10594 \times 1.08$$

$$Pmt = 23,686.326 \div 78.95442$$



PART III: CAPITAL BUDGETING

QUESTION (1):

Given below is a cash flows of project for Mahmood Company.

	Cash Flow	
Initial Cost	BD	18,000
Cash Flow Year 1	BD	3,600
Cash Flow Year 2	BD	7,200
Cash Flow Year 3	BD	9,000
Cash Flow Year 4	BD	10,800
Cash Flow Year 5	BD	18,000

2590

Required:

A. How long it will take to recover the initial cost?

Year	Cash Flow	Yet to be recovered	Payback Period
0	-18000	—	
1	3600	-18000 + 3600 = -14400	
2	7200	-14400 + 7200 = -7200	
3	9000	-7200 + 9000 = 1800	$2 + \frac{7200}{9000} = 2.8 \text{ years}$
4	10800		
5	18000		

B. Find the Profitability Index, should you accept this project?

Year	Cash Flow	Calculation	Present Value
0	-18000	$x(1+25\%)^{-0} = 1$	-18000
1	3600	$x(1+25\%)^{-1} = 0.8000$	2880
2	7200	$x(1+25\%)^{-2} = 0.6400$	4608
3	9000	$x(1+25\%)^{-3} = 0.5120$	4608
4	10800	$x(1+25\%)^{-4} = 0.4096$	4423.680
5	18000	$x(1+25\%)^{-5} = 0.3277$	5898.600
Net Present Value (NPV)			BD 4418.280

Profitability Index = $1 + \frac{NPV}{\text{Cost}} = 1 + \frac{4418.280}{18000} = 1.245$

Accept Project

Decision: () Accept Project () Reject Project



PART IV: BREAK EVEN POINT

QUESTION (1):

Ammar Company manufactures an office chairs that sells for BD180 per unit and whose total variable costs are BD135 per unit. The company's annual fixed costs are BD562,500. Management targets an annual operating income of BD1,012,500.

Required:

1. How many chairs must the company sell in order to break even? (Units)

$$= \frac{562500}{180 - 135} = 12500 \text{ Units}$$

2. What is the sales revenue (BD) the company must achieve to reach break even point?

$$12500 \text{ Units} \times \text{BD } 180 = \text{BD } 2,250,000$$

3. How many chairs must the company sell in order to reach a target operating income?

$$\frac{562500 + 1012500}{180 - 135} = 35000 \text{ Units}$$

4. Compute the profit or Loss if the company actual units' sales:

a. 15,000 units

$$P/L = 15000 \times (180 - 135) - 562500 = \text{BD } 112500 \text{ (Profit)}$$

b. 10,000 units

$$P/L = 10000 \times (180 - 135) - 562500 = \text{BD } -112500 \text{ (Loss)}$$



PART V: FINANAIAL RATIOS

QUESTION (1):

The following financial statements for Delmon Company, find the missing factors and calculate the following financial ratios

Income Statement			Balance Sheet		
Sales	BD	190,967	Cash	BD	11,193 ?
Cost of Goods Sold	BD	(182,217)	Merchandise Inventory	BD	20,577
Gross Profit	BD	8750 ?	Accounts Receivable	BD	31,579
Expenses	BD	(6,118)	Total Current Assets	BD	63,349
Profit Before Tax	BD	2632 ?	Fixed Assets	BD	104,167
Tax	BD	(263)	Total Assets	BD	167,515
Profit for the year	BD	2,370	Current Liabilities	BD	16,534 ?
			Long-Term Liabilities	BD	7,741
			Total Liabilities	BD	24,275
			Owner's Equity	BD	143,240
			Total OE and Liabilities	BD	167,515

Gross Profit Margin	$\frac{\text{Gross Profit}}{\text{Rev}} \times 100 = \frac{8750}{190967} \times 100 = 4.58\%$
Profit Margin	$\frac{\text{Profit Before Tax}}{\text{Revenues}} \times 100 = \frac{2632}{190967} \times 100 = 1.38\%$
Capital Employed	$\text{Total Assets} - \text{Current Liabilities}$ $167515 - 16534 = \text{BD } 150,981$
Return on Capital Employed	$\frac{\text{Profit B. Tax}}{\text{Capital Employed}} = \frac{2632}{150981} \times 100 = 1.74\%$
Working Capital	$= \text{Current Assets} - \text{Current Liabilities}$ $= 63349 - 16534 = \text{BD } 46815$
Current Ratio	$\frac{\text{CA}}{\text{CL}} = \frac{63349}{16534} = 3.83 \text{ times}$
Acid-Test Ratio	$\frac{\text{CA} - \text{Inventory}}{\text{CL}} = \frac{63349 - 20577}{16534} = 2.59 \text{ times}$



Table No. 1		Equation: $FV = PV (1+i)^n$					FV For One Monetary Unit			
	5.75%	6.00%	6.25%	6.50%	6.75%	7.00%	7.25%	7.50%	7.75%	8.00%
1	1.0575	1.0600	1.0625	1.0650	1.0675	1.0700	1.0725	1.0750	1.0775	1.0800
2	1.1183	1.1236	1.1289	1.1342	1.1396	1.1449	1.1503	1.1556	1.1610	1.1664
3	1.1826	1.1910	1.1995	1.2079	1.2165	1.2250	1.2336	1.2423	1.2510	1.2597
4	1.2506	1.2625	1.2744	1.2865	1.2986	1.3108	1.3231	1.3355	1.3479	1.3605
5	1.3225	1.3382	1.3541	1.3701	1.3862	1.4026	1.4190	1.4356	1.4524	1.4693
6	1.3986	1.4185	1.4387	1.4591	1.4798	1.5007	1.5219	1.5433	1.5650	1.5869
7	1.4790	1.5036	1.5286	1.5540	1.5797	1.6058	1.6322	1.6590	1.6862	1.7138
8	1.5640	1.5938	1.6242	1.6550	1.6863	1.7182	1.7506	1.7835	1.8169	1.8509
9	1.6540	1.6895	1.7257	1.7626	1.8002	1.8385	1.8775	1.9172	1.9577	1.9990
10	1.7491	1.7908	1.8335	1.8771	1.9217	1.9672	2.0136	2.0610	2.1095	2.1589
11	1.8496	1.8983	1.9481	1.9992	2.0514	2.1049	2.1596	2.2156	2.2730	2.3316
12	1.9560	2.0122	2.0699	2.1291	2.1899	2.2522	2.3162	2.3818	2.4491	2.5182
13	2.0684	2.1329	2.1993	2.2675	2.3377	2.4098	2.4841	2.5604	2.6389	2.7196
14	2.1874	2.2609	2.3367	2.4149	2.4955	2.5785	2.6642	2.7524	2.8434	2.9372
15	2.3132	2.3966	2.4828	2.5718	2.6639	2.7590	2.8573	2.9589	3.0638	3.1722
16	2.4462	2.5404	2.6379	2.7390	2.8437	2.9522	3.0645	3.1808	3.3012	3.4259
17	2.5868	2.6928	2.8028	2.9170	3.0357	3.1588	3.2867	3.4194	3.5571	3.7000
18	2.7356	2.8543	2.9780	3.1067	3.2406	3.3799	3.5249	3.6758	3.8328	3.9960
19	2.8929	3.0256	3.1641	3.3086	3.4593	3.6165	3.7805	3.9515	4.1298	4.3157
20	3.0592	3.2071	3.3619	3.5236	3.6928	3.8697	4.0546	4.2479	4.4499	4.6610
21	3.2351	3.3996	3.5720	3.7527	3.9421	4.1406	4.3485	4.5664	4.7947	5.0338
22	3.4211	3.6035	3.7952	3.9966	4.2082	4.4304	4.6638	4.9089	5.1663	5.4365
23	3.6178	3.8197	4.0324	4.2564	4.4922	4.7405	5.0019	5.2771	5.5667	5.8715
24	3.8259	4.0489	4.2844	4.5331	4.7954	5.0724	5.3646	5.6729	5.9981	6.3412
25	4.0458	4.2919	4.5522	4.8277	5.1191	5.4274	5.7535	6.0983	6.4630	6.8485
26	4.2785	4.5494	4.8367	5.1415	5.4647	5.8074	6.1706	6.5557	6.9638	7.3964
27	4.5245	4.8223	5.1390	5.4757	5.8335	6.2139	6.6180	7.0474	7.5035	7.9881
28	4.7847	5.1117	5.4602	5.8316	6.2273	6.6488	7.0978	7.5759	8.0851	8.6271
29	5.0598	5.4184	5.8015	6.2107	6.6477	7.1143	7.6124	8.1441	8.7117	9.3173
30	5.3507	5.7435	6.1641	6.6144	7.0964	7.6123	8.1643	8.7550	9.3868	10.0627
31	5.6584	6.0881	6.5493	7.0443	7.5754	8.1451	8.7562	9.4116	10.1143	10.8677
32	5.9837	6.4534	6.9587	7.5022	8.0867	8.7153	9.3910	10.1174	10.8982	11.7371
33	6.3278	6.8406	7.3936	7.9898	8.6326	9.3253	10.0719	10.8763	11.7428	12.6760
34	6.6916	7.2510	7.8557	8.5092	9.2153	9.9781	10.8021	11.6920	12.6528	13.6901
35	7.0764	7.6861	8.3467	9.0623	9.8373	10.6766	11.5853	12.5689	13.6334	14.7853
36	7.4833	8.1473	8.8683	9.6513	10.5013	11.4239	12.4252	13.5115	14.6900	15.9682
37	7.9136	8.6361	9.4226	10.2786	11.2102	12.2236	13.3260	14.5249	15.8285	17.2456
38	8.3686	9.1543	10.0115	10.9467	11.9668	13.0793	14.2921	15.6143	17.0552	18.6253
39	8.8498	9.7035	10.6372	11.6583	12.7746	13.9948	15.3283	16.7853	18.3770	20.1153
40	9.3587	10.2857	11.3021	12.4161	13.6369	14.9745	16.4396	18.0442	19.8012	21.7245
41	9.8968	10.9029	12.0084	13.2231	14.5574	16.0227	17.6315	19.3976	21.3358	23.4625
42	10.4659	11.5570	12.7590	14.0826	15.5400	17.1443	18.9098	20.8524	22.9893	25.3395
43	11.0677	12.2505	13.5564	14.9980	16.5890	18.3444	20.2807	22.4163	24.7710	27.3666
44	11.7041	12.9855	14.4037	15.9729	17.7087	19.6285	21.7511	24.0975	26.6907	29.5560
45	12.3770	13.7646	15.3039	17.0111	18.9040	21.0025	23.3281	25.9048	28.7592	31.9204
46	13.0887	14.5905	16.2604	18.1168	20.1801	22.4726	25.0193	27.8477	30.9881	34.4741
47	13.8413	15.4659	17.2767	19.2944	21.5422	24.0457	26.8332	29.9363	33.3897	37.2320
48	14.6372	16.3939	18.3565	20.5485	22.9963	25.7289	28.7787	32.1815	35.9774	40.2106
49	15.4788	17.3775	19.5037	21.8842	24.5486	27.5299	30.8651	34.5951	38.7656	43.4274
50	16.3689	18.4202	20.7227	23.3067	26.2056	29.4570	33.1028	37.1897	41.7699	46.9016



TABLE (PV OF ORDINARY ANNUITY)		(ANNUITY IN ARREARS ... END OF PERIOD)							
	5.00%	6.00%	7.00%	8.00%	9.00%	10.00%	11.00%	12.00%	15.00%
1	0.95238	0.94340	0.93458	0.92593	0.91743	0.90909	0.90090	0.89286	0.86957
2	1.85941	1.83339	1.80802	1.78326	1.75911	1.73554	1.71252	1.69005	1.62571
3	2.72325	2.67301	2.62432	2.57710	2.53129	2.48685	2.44371	2.40183	2.28323
4	3.54595	3.46511	3.38721	3.31213	3.23972	3.16987	3.10245	3.03735	2.85498
5	4.32948	4.21236	4.10020	3.99271	3.88965	3.79079	3.69590	3.60478	3.35216
6	5.07569	4.91732	4.76654	4.62288	4.48592	4.35526	4.23054	4.11141	3.78448
7	5.78637	5.58238	5.38929	5.20637	5.03295	4.86842	4.71220	4.56376	4.16042
8	6.46321	6.20979	5.97130	5.74664	5.53482	5.33493	5.14612	4.96764	4.48732
9	7.10782	6.80169	6.51523	6.24689	5.99525	5.75902	5.53705	5.32825	4.77158
10	7.72173	7.36009	7.02358	6.71008	6.41766	6.14457	5.88923	5.65022	5.01877
11	8.30641	7.88687	7.49867	7.13896	6.80519	6.49506	6.20652	5.93770	5.23371
12	8.86325	8.38384	7.94269	7.53608	7.16073	6.81369	6.49236	6.19437	5.42062
13	9.39357	8.85268	8.35765	7.90378	7.48690	7.10336	6.74987	6.42355	5.58315
14	9.89864	9.29498	8.74547	8.24424	7.78615	7.36669	6.98187	6.62817	5.72448
15	10.37966	9.71225	9.10791	8.55948	8.06069	7.60608	7.19087	6.81086	5.84737
16	10.83777	10.10590	9.44665	8.85137	8.31256	7.82371	7.37916	6.97399	5.95423
17	11.27407	10.47726	9.76322	9.12164	8.54363	8.02155	7.54879	7.11963	6.04716
18	11.68959	10.82760	10.05909	9.37189	8.75563	8.20141	7.70162	7.24967	6.12797
19	12.08532	11.15812	10.33560	9.60360	8.95011	8.36492	7.83929	7.36578	6.19823
20	12.46221	11.46992	10.59401	9.81815	9.12855	8.51356	7.96333	7.46944	6.25933
21	12.82115	11.76408	10.83553	10.01680	9.29224	8.64869	8.07507	7.56200	6.31246
22	13.16300	12.04158	11.06124	10.20074	9.44243	8.77154	8.17574	7.64465	6.35866
23	13.48857	12.30338	11.27219	10.37106	9.58021	8.88322	8.26643	7.71843	6.39884
24	13.79864	12.55036	11.46933	10.52876	9.70661	8.98474	8.34814	7.78432	6.43377
25	14.09394	12.78336	11.65358	10.67478	9.82258	9.07704	8.42174	7.84314	6.46415
26	14.37519	13.00317	11.82578	10.80998	9.92897	9.16095	8.48806	7.89566	6.49056
27	14.64303	13.21053	11.98671	10.93516	10.02658	9.23722	8.54780	7.94255	6.51353
28	14.89813	13.40616	12.13711	11.05108	10.11613	9.30657	8.60162	7.98442	6.53351
29	15.14107	13.59072	12.27767	11.15841	10.19828	9.36961	8.65011	8.02181	6.55088
30	15.37245	13.76483	12.40904	11.25778	10.27365	9.42691	8.69379	8.05518	6.56598
31	15.59281	13.92909	12.53181	11.34980	10.34280	9.47901	8.73315	8.08499	6.57911
32	15.80268	14.08404	12.64656	11.43500	10.40624	9.52638	8.76860	8.11159	6.59053
33	16.00255	14.23023	12.75379	11.51389	10.46444	9.56943	8.80054	8.13535	6.60046
34	16.19290	14.36814	12.85401	11.58693	10.51784	9.60857	8.82932	8.15656	6.60910
35	16.37419	14.49825	12.94767	11.65457	10.56682	9.64416	8.85524	8.17550	6.61661
36	16.54685	14.62099	13.03521	11.71719	10.61176	9.67651	8.87859	8.19241	6.62314
37	16.71129	14.73678	13.11702	11.77518	10.65299	9.70592	8.89963	8.20751	6.62881
38	16.86789	14.84602	13.19347	11.82887	10.69082	9.73265	8.91859	8.22099	6.63375
39	17.01704	14.94907	13.26493	11.87858	10.72552	9.75696	8.93567	8.23303	6.63805
40	17.15909	15.04630	13.33171	11.92461	10.75736	9.77905	8.95105	8.24378	6.64178
41	17.29437	15.13802	13.39412	11.96723	10.78657	9.79914	8.96491	8.25337	6.64502
42	17.42321	15.22454	13.45245	12.00670	10.81337	9.81740	8.97740	8.26194	6.64785
43	17.54591	15.30617	13.50696	12.04324	10.83795	9.83400	8.98865	8.26959	6.65030
44	17.66277	15.38318	13.55791	12.07707	10.86051	9.84909	8.99878	8.27642	6.65244
45	17.77407	15.45583	13.60552	12.10840	10.88120	9.86281	9.00791	8.28252	6.65429
46	17.88007	15.52437	13.65002	12.13741	10.90018	9.87528	9.01614	8.28796	6.65591
47	17.98102	15.58903	13.69161	12.16427	10.91760	9.88662	9.02355	8.29282	6.65731
48	18.07716	15.65003	13.73047	12.18914	10.93358	9.89693	9.03022	8.29716	6.65853
49	18.16872	15.70757	13.76680	12.21216	10.94823	9.90630	9.03624	8.30104	6.65959
50	18.25593	15.76186	13.80075	12.23348	10.96168	9.91481	9.04165	8.30450	6.66051





TABLE (FV OF ORDINARY ANNUITY)					(ANNUITY IN ARREARS ... END OF PERIOD)				
	5.00%	6.00%	7.00%	8.00%	9.00%	10.00%	11.00%	12.00%	15.00%
1	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
2	2.05000	2.06000	2.07000	2.08000	2.09000	2.10000	2.11000	2.12000	2.15000
3	3.15250	3.18360	3.21490	3.24640	3.27810	3.31000	3.34210	3.37440	3.47250
4	4.31013	4.37462	4.43994	4.50611	4.57313	4.64100	4.70973	4.77933	4.99338
5	5.52563	5.63709	5.75074	5.86660	5.98471	6.10510	6.22780	6.35285	6.74238
6	6.80191	6.97532	7.15329	7.33593	7.52333	7.71561	7.91286	8.11519	8.75374
7	8.14201	8.39384	8.65402	8.92280	9.20043	9.48717	9.78327	10.08901	11.06680
8	9.54911	9.89747	10.25980	10.63663	11.02847	11.43589	11.85943	12.29969	13.72682
9	11.02656	11.49132	11.97799	12.48756	13.02104	13.57948	14.16397	14.77566	16.78584
10	12.57789	13.18079	13.81645	14.48656	15.19293	15.93742	16.72201	17.54874	20.30372
11	14.20679	14.97164	15.78360	16.64549	17.56029	18.53117	19.56143	20.65458	24.34928
12	15.91713	16.86994	17.88845	18.97713	20.14072	21.38428	22.71319	24.13313	29.00167
13	17.71298	18.88214	20.14064	21.49530	22.95338	24.52271	26.21164	28.02911	34.35192
14	19.59863	21.01507	22.55049	24.21492	26.01919	27.97498	30.09492	32.39260	40.50471
15	21.57856	23.27597	25.12902	27.15211	29.36092	31.77248	34.40536	37.27971	47.58041
16	23.65749	25.67253	27.88805	30.32428	33.00340	35.94973	39.18995	42.75328	55.71747
17	25.84037	28.21288	30.84022	33.75023	36.97370	40.54470	44.50084	48.88367	65.07509
18	28.13238	30.90565	33.99903	37.45024	41.30134	45.59917	50.39594	55.74971	75.83636
19	30.53900	33.75999	37.37896	41.44626	46.01846	51.15909	56.93949	63.43968	88.21181
20	33.06595	36.78559	40.99549	45.76196	51.16012	57.27500	64.20283	72.05244	102.44358
21	35.71925	39.99273	44.86518	50.42292	56.76453	64.00250	72.26514	81.69874	118.81012
22	38.50521	43.39229	49.00574	55.45676	62.87334	71.40275	81.21431	92.50258	137.63164
23	41.43048	46.99583	53.43614	60.89330	69.53194	79.54302	91.14788	104.60289	159.27638
24	44.50200	50.81558	58.17667	66.76476	76.78981	88.49733	102.17415	118.15524	184.16784
25	47.72710	54.86451	63.24904	73.10594	84.70090	98.34706	114.41331	133.33387	212.79302
26	51.11345	59.15638	68.67647	79.95442	93.32398	109.18177	127.99877	150.33393	245.71197
27	54.66913	63.70577	74.48382	87.35077	102.72313	121.09994	143.07864	169.37401	283.56877
28	58.40258	68.52811	80.69769	95.33883	112.96822	134.20994	159.81729	190.69889	327.10408
29	62.32271	73.63980	87.34653	103.96594	124.13536	148.63093	178.39719	214.58275	377.16969
30	66.43885	79.05819	94.46079	113.28321	136.30754	164.49402	199.02088	241.33268	434.74515
31	70.76079	84.80168	102.07304	123.34587	149.57522	181.94342	221.91317	271.29261	500.95692
32	75.29883	90.88978	110.21815	134.21354	164.03699	201.13777	247.32362	304.84772	577.10046
33	80.06377	97.34316	118.93343	145.95062	179.80032	222.25154	275.52922	342.42945	664.66552
34	85.06696	104.18375	128.25876	158.62667	196.98234	245.47670	306.83744	384.52098	765.36535
35	90.32031	111.43478	138.23688	172.31680	215.71075	271.02437	341.58955	431.66350	881.17016
36	95.83632	119.12087	148.91346	187.10215	236.12472	299.12681	380.16441	484.46312	1014.34568
37	101.62814	127.26812	160.33740	203.07032	258.37595	330.03949	422.98249	543.59869	1167.49753
38	107.70955	135.90421	172.56102	220.31595	282.62978	364.04343	470.51056	609.83053	1343.62216
39	114.09502	145.05846	185.64029	238.94122	309.06646	401.44778	523.26673	684.01020	1546.16549
40	120.79977	154.76197	199.63511	259.05652	337.88245	442.59256	581.82607	767.09142	1779.09031
41	127.83976	165.04768	214.60957	280.78104	369.29187	487.85181	646.82693	860.14239	2046.95385
42	135.23175	175.95054	230.63224	304.24352	403.52813	537.63699	718.97790	964.35948	2354.99693
43	142.99334	187.50758	247.77650	329.58301	440.84566	592.40069	799.06547	1081.08262	2709.24647
44	151.14301	199.75803	266.12085	356.94965	481.52177	652.64076	887.96267	1211.81253	3116.63344
45	159.70016	212.74351	285.74931	386.50562	525.85873	718.90484	986.63856	1358.23003	3585.12846
46	168.68516	226.50812	306.75176	418.42607	574.18602	791.79532	1096.16880	1522.21764	4123.89773
47	178.11942	241.09861	329.22439	452.90015	626.86276	871.97485	1217.74737	1705.88375	4743.48239
48	188.02539	256.56453	353.27009	490.13216	684.28041	960.17234	1352.69958	1911.58980	5456.00475
49	198.42666	272.95840	378.99900	530.34274	746.86565	1057.18957	1502.49653	2141.98058	6275.40546
50	209.34800	290.33590	406.52893	573.77016	815.08356	1163.90853	1668.77115	2400.01825	7217.71628



	TABLE (PV OF ANNUITY DUE)				(ANNUITY IN ADVANCE ... BEGINNING OF PERIOD)				
	5.00%	6.00%	7.00%	8.00%	9.00%	10.00%	11.00%	12.00%	15.00%
1	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
2	1.95238	1.94340	1.93458	1.92593	1.91743	1.90909	1.90090	1.89286	1.86957
3	2.85941	2.83339	2.80802	2.78326	2.75911	2.73554	2.71252	2.69005	2.62571
4	3.72325	3.67301	3.62432	3.57710	3.53129	3.48685	3.44371	3.40183	3.28323
5	4.54595	4.46511	4.38721	4.31213	4.23972	4.16987	4.10245	4.03735	3.85498
6	5.32948	5.21236	5.10020	4.99271	4.88965	4.79079	4.69590	4.60478	4.35216
7	6.07569	5.91732	5.76654	5.62288	5.48592	5.35526	5.23054	5.11141	4.78448
8	6.78637	6.58238	6.38929	6.20637	6.03295	5.86842	5.71220	5.56376	5.16042
9	7.46321	7.20979	6.97130	6.74664	6.53482	6.33493	6.14612	5.96764	5.48732
10	8.10782	7.80169	7.51523	7.24689	6.99525	6.75902	6.53705	6.32825	5.77158
11	8.72173	8.36009	8.02358	7.71008	7.41766	7.14457	6.88923	6.65022	6.01877
12	9.30641	8.88687	8.49867	8.13896	7.80519	7.49506	7.20652	6.93770	6.23371
13	9.86325	9.38384	8.94269	8.53608	8.16073	7.81369	7.49236	7.19437	6.42062
14	10.39357	9.85268	9.35765	8.90378	8.48690	8.10336	7.74987	7.42355	6.58315
15	10.89864	10.29498	9.74547	9.24424	8.78615	8.36669	7.98187	7.62817	6.72448
16	11.37966	10.71225	10.10791	9.55948	9.06069	8.60608	8.19087	7.81086	6.84737
17	11.83777	11.10590	10.44665	9.85137	9.31256	8.82371	8.37916	7.97399	6.95423
18	12.27407	11.47726	10.76322	10.12164	9.54363	9.02155	8.54879	8.11963	7.04716
19	12.68959	11.82760	11.05909	10.37189	9.75563	9.20141	8.70162	8.24967	7.12797
20	13.08532	12.15812	11.33560	10.60360	9.95011	9.36492	8.83929	8.36578	7.19823
21	13.46221	12.46992	11.59401	10.81815	10.12855	9.51356	8.96333	8.46944	7.25933
22	13.82115	12.76408	11.83553	11.01680	10.29224	9.64869	9.07507	8.56200	7.31246
23	14.16300	13.04158	12.06124	11.20074	10.44243	9.77154	9.17574	8.64465	7.35866
24	14.48857	13.30338	12.27219	11.37106	10.58021	9.88322	9.26643	8.71843	7.39884
25	14.79864	13.55036	12.46933	11.52876	10.70661	9.98474	9.34814	8.78432	7.43377
26	15.09394	13.78336	12.65358	11.67478	10.82258	10.07704	9.42174	8.84314	7.46415
27	15.37519	14.00317	12.82578	11.80998	10.92897	10.16095	9.48806	8.89566	7.49056
28	15.64303	14.21053	12.98671	11.93516	11.02658	10.23722	9.54780	8.94255	7.51353
29	15.89813	14.40616	13.13711	12.05108	11.11613	10.30657	9.60162	8.98442	7.53351
30	16.14107	14.59072	13.27767	12.15841	11.19828	10.36961	9.65011	9.02181	7.55088
31	16.37245	14.76483	13.40904	12.25778	11.27365	10.42691	9.69379	9.05518	7.56598
32	16.59281	14.92909	13.53181	12.34980	11.34280	10.47901	9.73315	9.08499	7.57911
33	16.80268	15.08404	13.64656	12.43500	11.40624	10.52638	9.76860	9.11159	7.59053
34	17.00255	15.23023	13.75379	12.51389	11.46444	10.56943	9.80054	9.13535	7.60046
35	17.19290	15.36814	13.85401	12.58693	11.51784	10.60857	9.82932	9.15656	7.60910
36	17.37419	15.49825	13.94767	12.65457	11.56682	10.64416	9.85524	9.17550	7.61661
37	17.54685	15.62099	14.03521	12.71719	11.61176	10.67651	9.87859	9.19241	7.62314
38	17.71129	15.73678	14.11702	12.77518	11.65299	10.70592	9.89963	9.20751	7.62881
39	17.86789	15.84602	14.19347	12.82887	11.69082	10.73265	9.91859	9.22099	7.63375
40	18.01704	15.94907	14.26493	12.87858	11.72552	10.75696	9.93567	9.23303	7.63805
41	18.15909	16.04630	14.33171	12.92461	11.75736	10.77905	9.95105	9.24378	7.64178
42	18.29437	16.13802	14.39412	12.96723	11.78657	10.79914	9.96491	9.25337	7.64502
43	18.42321	16.22454	14.45245	13.00670	11.81337	10.81740	9.97740	9.26194	7.64785
44	18.54591	16.30617	14.50696	13.04324	11.83795	10.83400	9.98865	9.26959	7.65030
45	18.66277	16.38318	14.55791	13.07707	11.86051	10.84909	9.99878	9.27642	7.65244
46	18.77407	16.45583	14.60552	13.10840	11.88120	10.86281	10.00791	9.28252	7.65429
47	18.88007	16.52437	14.65002	13.13741	11.90018	10.87528	10.01614	9.28796	7.65591
48	18.98102	16.58903	14.69161	13.16427	11.91760	10.88662	10.02355	9.29282	7.65731
49	19.07716	16.65003	14.73047	13.18914	11.93358	10.89693	10.03022	9.29716	7.65853
50	19.16872	16.70757	14.76680	13.21216	11.94823	10.90630	10.03624	9.30104	7.65959





	TABLE (FV OF ANNUITY DUE)				(ANNUITY IN ADVANCE ... BEGINNING OF PERIOD)				
	5.00%	6.00%	7.00%	8.00%	9.00%	10.00%	11.00%	12.00%	15.00%
1	1.05000	1.06000	1.07000	1.08000	1.09000	1.10000	1.11000	1.12000	1.15000
2	2.15250	2.18360	2.21490	2.24640	2.27810	2.31000	2.34210	2.37440	2.47250
3	3.31013	3.37462	3.43994	3.50611	3.57313	3.64100	3.70973	3.77933	3.99338
4	4.52563	4.63709	4.75074	4.86660	4.98471	5.10510	5.22780	5.35285	5.74238
5	5.80191	5.97532	6.15329	6.33593	6.52333	6.71561	6.91286	7.11519	7.75374
6	7.14201	7.39384	7.65402	7.92280	8.20043	8.48717	8.78327	9.08901	10.06680
7	8.54911	8.89747	9.25980	9.63663	10.02847	10.43589	10.85943	11.29969	12.72682
8	10.02656	10.49132	10.97799	11.48756	12.02104	12.57948	13.16397	13.77566	15.78584
9	11.57789	12.18079	12.81645	13.48656	14.19293	14.93742	15.72201	16.54874	19.30372
10	13.20679	13.97164	14.78360	15.64549	16.56029	17.53117	18.56143	19.65458	23.34928
11	14.91713	15.86994	16.88845	17.97713	19.14072	20.38428	21.71319	23.13313	28.00167
12	16.71298	17.88214	19.14064	20.49530	21.95338	23.52271	25.21164	27.02911	33.35192
13	18.59863	20.01507	21.55049	23.21492	25.01919	26.97498	29.09492	31.39260	39.50471
14	20.57856	22.27597	24.12902	26.15211	28.36092	30.77248	33.40536	36.27971	46.58041
15	22.65749	24.67253	26.88805	29.32428	32.00340	34.94973	38.18995	41.75328	54.71747
16	24.84037	27.21288	29.84022	32.75023	35.97370	39.54470	43.50084	47.88367	64.07509
17	27.13238	29.90565	32.99903	36.45024	40.30134	44.59917	49.39594	54.74971	74.83636
18	29.53900	32.75999	36.37896	40.44626	45.01846	50.15909	55.93949	62.43968	87.21181
19	32.06595	35.78559	39.99549	44.76196	50.16012	56.27500	63.20283	71.05244	101.44358
20	34.71925	38.99273	43.86518	49.42292	55.76453	63.00250	71.26514	80.69874	117.81012
21	37.50521	42.39229	48.00574	54.45676	61.87334	70.40275	80.21431	91.50258	136.63164
22	40.43048	45.99583	52.43614	59.89330	68.53194	78.54302	90.14788	103.60289	158.27638
23	43.50200	49.81558	57.17667	65.76476	75.78981	87.49733	101.17415	117.15524	183.16784
24	46.72710	53.86451	62.24904	72.10594	83.70090	97.34706	113.41331	132.33387	211.79302
25	50.11345	58.15638	67.67647	78.95442	92.32398	108.18177	126.99877	149.33393	244.71197
26	53.66913	62.70577	73.48382	86.35077	101.72313	120.09994	142.07864	168.37401	282.56877
27	57.40258	67.52811	79.69769	94.33883	111.96822	133.20994	158.81729	189.69889	326.10408
28	61.32271	72.63980	86.34653	102.96594	123.13536	147.63093	177.39719	213.58275	376.16969
29	65.43885	78.05819	93.46079	112.28321	135.30754	163.49402	198.02088	240.33268	433.74515
30	69.76079	83.80168	101.07304	122.34587	148.57522	180.94342	220.91317	270.29261	499.95692
31	74.29883	89.88978	109.21815	133.21354	163.03699	200.13777	246.32362	303.84772	576.10046
32	79.06377	96.34316	117.93343	144.95062	178.80032	221.25154	274.52922	341.42945	663.66552
33	84.06696	103.18375	127.25876	157.62667	195.98234	244.47670	305.83744	383.52098	764.36535
34	89.32031	110.43478	137.23688	171.31680	214.71075	270.02437	340.58955	430.66350	880.17016
35	94.83632	118.12087	147.91346	186.10215	235.12472	298.12681	379.16441	483.46312	1013.34568
36	100.62814	126.26812	159.33740	202.07032	257.37595	329.03949	421.98249	542.59869	1166.49753
37	106.70955	134.90421	171.56102	219.31595	281.62978	363.04343	469.51056	608.83053	1342.62216
38	113.09502	144.05846	184.64029	237.94122	308.06646	400.44778	522.26673	683.01020	1545.16549
39	119.79977	153.76197	198.63511	258.05652	336.88245	441.59256	580.82607	766.09142	1778.09031
40	126.83976	164.04768	213.60957	279.78104	368.29187	486.85181	645.82693	859.14239	2045.95385
41	134.23175	174.95054	229.63224	303.24352	402.52813	536.63699	717.97790	963.35948	2353.99693
42	141.99334	186.50758	246.77650	328.58301	439.84566	591.40069	798.06547	1080.08262	2708.24647
43	150.14301	198.75803	265.12085	355.94965	480.52177	651.64076	886.96267	1210.81253	3115.63344
44	158.70016	211.74351	284.74931	385.50562	524.85873	717.90484	985.63856	1357.23003	3584.12846
45	167.68516	225.50812	305.75176	417.42607	573.18602	790.79532	1095.16880	1521.21764	4122.89773
46	177.11942	240.09861	328.22439	451.90015	625.86276	870.97485	1216.74737	1704.88375	4742.48239
47	187.02539	255.56453	352.27009	489.13216	683.28041	959.17234	1351.69958	1910.58980	5455.00475
48	197.42666	271.95840	377.99900	529.34274	745.86565	1056.18957	1501.49653	2140.98058	6274.40546
49	208.34800	289.33590	405.52893	572.77016	814.08356	1162.90853	1667.77115	2399.01825	7216.71628
50	219.81540	307.75606	434.98595	619.67177	888.44108	1280.29938	1852.33598	2688.02044	8300.37372