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2ND SEM. 2013/2014

UNIVERSITY OF SWAZILAND

FINAL EXAMINATION PAPER

PROGRAMME:

Bsc. Agricultural Biosystems & Engineering 2

Bsc. Agricultural Economics & Agribusiness 2

Bsc. Agricultural Education 2

Bsc. Agronomy 2

Bsc. Animal Science 2

Bsc. Animal Science-Dairy Option 2

Bsc. Horticulture 2

COURSE CODE:

AEM 205

TITLE OF PAPER:

FARM BUSINESS MANAGEMENT

TIME ALLOWED:

TWO (2) HOURS

INSTRUCTION: 1.

ANSWER ALL QUESTIONS

2.

EACH QUESTION CARRIES TWENTY FIVE (25) MARKS

**DO NOT OPEN THIS PAPER UNTIL PERMISSION HAS BEEN GRANTED BY THE
CHIEF INVIGILATOR**

QUESTION 1

Farm businesses vary in physical scale and economic scale. The economic scale is mainly used in measuring the growth and productivity of a farm business. As an expert in farm management, the member of parliament in your area has asked you to present on economic of size in production to help the farmers in your constituency move towards the first world 2022 dream of Swaziland.

- a. Discuss the various economic scales as applicable in a farm business and how farmers can relate to them in their farm size as they target 2022. [12 marks]
- b. Using a graph, advise where these farmers should be operating in light of their dream to grow towards 2022. [8 marks]
- c. Define any five causes of economics of size. [5 marks]

[25 marks]

QUESTION 2

Technoserve advocates for the local production of animal feed ingredients like yellow maize, soya beans, sorghum and sunflower. The government of Swaziland has opted to start by promoting the yellow maize production in this list. He considers a scale of 3ha minimum per farmer for cost recovery. The 3ha requires E50 000 investment. Fincorp has pledge to be the main financier of this new initiative and has advised that the E50 000 credit can be repaid in 4years and interest fixed at 6%. The yellow maize can generate E 10 000 per year in net cash flow.

- A. Compute the net present value of the yellow maize investment. [15marks]
- B. What is the internal rate of return for the yellow maize project? [5 marks]
- C. Given your calculations above, should this yellow maize project be promoted? Justify your answer. [5marks]

[25 marks]

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QUESTION 3

- A. Farmer Jom has bought a farm with irrigation facilities and farming implements in it. He is excited as the bank has that they can lend him E60 000 for operating expenses. He considers the following enterprises given below with their MVPs. The E60 000 will be issued in units of E10 000.

Units	Fresh flowers	vegetables	Baby vegetables	Soya beans
First 10 000	4 000	3 800	4 000	3 800
Second 10 000	3 800	3 400	3 900	3 600
Third 10 000	3 600	3 300	3 800	3 400
Fourth 10 000	3 400	3 200	3 700	3 200
Fifth 10 000	3 200	3 100	3 600	3 000
Sixth 10 000	3 000	3 000	3 400	2 800

- How should this E 60 000 credit be used in the farm? [5marks]
- How much income will this E 60 000 credit generate for farmer Jomo? [5marks]
- If Jom's credit was not limited to E60 000 but abundantly open to what he desires. How much would you advise him to borrow and why? [10marks]
- How should he use the amount in C. and how much income would he make? [5marks]

[25 marks]

QUESTION 4

- A. In light of the 2022 first world dream for Swaziland, the head of extension service has identified the need for farmers to understand the law of diminishing returns as they push to produce more from their enterprises. He has asked you to prepare a brief on this law of diminishing returns for the next farmer meeting.
- a. State the law of diminishing returns as applicable to farming. [5 marks]
 - b. Using a graph illustrate how this law guides the enterprise operating level. [10 marks]
 - c. In relation to MPP and APP concepts, how does this law relate? [10marks]

[25 marks]

TABLE 1 Amortization Factors for Equal Total Payments

		Interest Rate											
Years	4%	4.5%	5%	5.5%	6%	6.5%	7%	7.5%	8%	8.5%	9%	9.5%	10%
1	1.04000	1.04500	1.05000	1.05500	1.06000	1.06500	1.07000	1.07500	1.08000	1.08500	1.09000	1.09500	1.10000
2	0.53020	0.53400	0.53780	0.54162	0.54544	0.54926	0.55309	0.55693	0.56077	0.56462	0.56847	0.57233	0.57619
3	0.36035	0.36377	0.36721	0.37065	0.37411	0.37758	0.38105	0.38454	0.38803	0.39154	0.39505	0.39858	0.40211
4	0.27549	0.27874	0.28201	0.28529	0.28859	0.29190	0.29523	0.29857	0.30192	0.30529	0.30867	0.31206	0.31547
5	0.22463	0.22779	0.23097	0.23418	0.23740	0.24063	0.24389	0.24716	0.25046	0.25377	0.25709	0.26044	0.26380
6	0.19076	0.19388	0.19702	0.20018	0.20336	0.20657	0.20980	0.21304	0.21632	0.21961	0.22292	0.22625	0.22961
7	0.16681	0.16970	0.17282	0.17596	0.17914	0.18233	0.18555	0.18880	0.19207	0.19537	0.19869	0.20204	0.20541
8	0.14863	0.15161	0.15472	0.15786	0.16104	0.16424	0.16747	0.17073	0.17401	0.17733	0.18067	0.18405	0.18744
9	0.13449	0.13757	0.14069	0.14384	0.14702	0.15024	0.15349	0.15677	0.16008	0.16342	0.16680	0.17020	0.17364
10	0.12329	0.12638	0.12950	0.13267	0.13587	0.13910	0.14238	0.14569	0.14903	0.15241	0.15582	0.15927	0.16275
11	0.11415	0.11725	0.12039	0.12357	0.12679	0.13006	0.13336	0.13670	0.14008	0.14349	0.14695	0.15044	0.15396
12	0.10655	0.10967	0.11283	0.11603	0.11928	0.12257	0.12590	0.12928	0.13270	0.13615	0.13965	0.14319	0.14676
13	0.10014	0.10328	0.10646	0.10968	0.11296	0.11628	0.11965	0.12306	0.12652	0.13002	0.13357	0.13715	0.14078
14	0.09467	0.09782	0.10102	0.10428	0.10758	0.11094	0.11434	0.11780	0.12130	0.12484	0.12843	0.13207	0.13575
15	0.08994	0.09311	0.09634	0.09963	0.10296	0.10635	0.10979	0.11329	0.11683	0.12042	0.12406	0.12774	0.13147
16	0.08582	0.08902	0.09227	0.09558	0.09895	0.10238	0.10586	0.10939	0.11298	0.11661	0.12030	0.12403	0.12782
17	0.08220	0.08542	0.08870	0.09204	0.09544	0.09891	0.10243	0.10600	0.10963	0.11331	0.11705	0.12083	0.12466
18	0.07899	0.08224	0.08555	0.08892	0.09236	0.09585	0.09941	0.10303	0.10670	0.11043	0.11421	0.11805	0.12193
19	0.07614	0.07941	0.08275	0.08615	0.08962	0.09316	0.09675	0.10041	0.10413	0.10790	0.11173	0.11561	0.11955
20	0.07358	0.07688	0.08024	0.08368	0.08718	0.09078	0.09439	0.09809	0.10185	0.10567	0.10955	0.11348	0.11746
21	0.07128	0.07460	0.07800	0.08146	0.08500	0.08861	0.09229	0.09603	0.09983	0.10370	0.10762	0.11159	0.11562
22	0.06920	0.07255	0.07597	0.07947	0.08305	0.08669	0.09041	0.09419	0.09803	0.10194	0.10590	0.10993	0.11401
23	0.06731	0.07068	0.07414	0.07767	0.08128	0.08496	0.08871	0.09254	0.09642	0.10037	0.10438	0.10845	0.11257
24	0.06559	0.06899	0.07247	0.07604	0.07968	0.08340	0.08719	0.09105	0.09498	0.09897	0.10302	0.10713	0.11130
25	0.06401	0.06744	0.07095	0.07455	0.07823	0.08198	0.08581	0.08971	0.09368	0.09771	0.10181	0.10596	0.11017
26	0.05783	0.06139	0.06505	0.06881	0.07265	0.07658	0.08059	0.08467	0.08883	0.09305	0.09734	0.10168	0.10608
27	0.05358	0.05727	0.06107	0.06497	0.06897	0.07306	0.07723	0.08148	0.08580	0.09019	0.09464	0.09914	0.10369
28	0.05052	0.05434	0.05828	0.06232	0.06646	0.07069	0.07501	0.07940	0.08386	0.08838	0.09296	0.09759	0.10228

TABLE 1 Amortization Factors for Equal Total Payments (Continued)

		Interest Rate											
Years	10.5%	11%	11.5%	12%	12.5%	13%	13.5%	14%	14.5%	15%	15.5%	16%	16.5%
1	1.10500	1.11000	1.11500	1.12000	1.12500	1.13000	1.13500	1.14000	1.14500	1.15000	1.15500	1.16000	1.16500
2	0.58006	0.58393	0.58781	0.59170	0.59559	0.59948	0.60338	0.60729	0.61120	0.61512	0.61904	0.62296	0.62689
3	0.40566	0.40921	0.41278	0.41635	0.41993	0.42352	0.42712	0.43073	0.43435	0.43798	0.44161	0.44526	0.44891
4	0.31889	0.32233	0.32577	0.32923	0.33271	0.33619	0.33969	0.34320	0.34673	0.35027	0.35381	0.35738	0.36095
5	0.26718	0.27057	0.27398	0.27741	0.28085	0.28431	0.28779	0.29128	0.29479	0.29832	0.30185	0.30541	0.30898
6	0.23298	0.23638	0.23979	0.24323	0.24668	0.25015	0.25365	0.25716	0.26069	0.26424	0.26780	0.27139	0.27499
7	0.20880	0.21222	0.21566	0.21912	0.22260	0.22611	0.22964	0.23319	0.23677	0.24036	0.24398	0.24761	0.25127
8	0.19087	0.19432	0.19780	0.20130	0.20483	0.20839	0.21197	0.21557	0.21920	0.22285	0.22653	0.23022	0.23395
9	0.17711	0.18060	0.18413	0.18768	0.19126	0.19487	0.19851	0.20217	0.20586	0.20957	0.21332	0.21708	0.22087
10	0.16626	0.16980	0.17338	0.17698	0.18062	0.18429	0.18799	0.19171	0.19547	0.19925	0.20306	0.20690	0.21077
11	0.15752	0.16112	0.16475	0.16842	0.17211	0.17584	0.17960	0.18339	0.18722	0.19107	0.19495	0.19886	0.20280
12	0.15038	0.15403	0.15771	0.16144	0.16519	0.16899	0.17281	0.17667	0.18056	0.18448	0.18843	0.19241	0.19643
13	0.14445	0.14815	0.15190	0.15568	0.15950	0.16335	0.16724	0.17116	0.17512	0.17911	0.18313	0.18718	0.19127
14	0.13947	0.14323	0.14703	0.15087	0.15475	0.15867	0.16262	0.16661	0.17063	0.17469	0.17878	0.18290	0.18705
15	0.13525	0.13907	0.14292	0.14682	0.15076	0.15474	0.15878	0.16281	0.16690	0.17102	0.17517	0.17936	0.18357
16	0.13164	0.13552	0.13943	0.14339	0.14739	0.15143	0.15550	0.15962	0.16376	0.16795	0.17216	0.17641	0.18069
17	0.12854	0.13247	0.13644	0.14046	0.14451	0.14861	0.15274	0.15692	0.16112	0.16537	0.16964	0.17395	0.17829
18	0.12586	0.12984	0.13387	0.13794	0.14205	0.14620	0.15039	0.15462	0.15889	0.16319	0.16752	0.17188	0.17628
19	0.12353	0.12756	0.13164	0.13576	0.13993	0.14413	0.14838	0.15266	0.15698	0.16134	0.16572	0.17014	0.17459
20	0.12149	0.12558	0.12970	0.13388	0.13810	0.14235	0.14665	0.15099	0.15536	0.15976	0.16420	0.16867	0.17316
21	0.11971	0.12384	0.12802	0.13224	0.13651	0.14081	0.14518	0.14954	0.15396	0.15842	0.16290	0.16742	0.17196
22	0.11813	0.12231	0.12654	0.13081	0.13512	0.13948	0.14387	0.14830	0.15277	0.15727	0.16179	0.16635	0.17094
23	0.11675	0.12097	0.12524	0.12956	0.13392	0.13832	0.14276	0.14723	0.15174	0.15628	0.16085	0.16545	0.17007
24	0.11552	0.11979	0.12410	0.12846	0.13287	0.13731	0.14179	0.14630	0.15085	0.15543	0.16004	0.16467	0.16933
25	0.11443	0.11874	0.12310	0.12750	0.13194	0.13643	0.14095	0.14550	0.15008	0.15470	0.15934	0.16401	0.16871
26	0.11053	0.11502	0.11956	0.12414	0.12876	0.13341	0.13809	0.14280	0.14754	0.15230	0.15708	0.16189	0.16671
27	0.10829	0.11293	0.11760	0.12232	0.12708	0.13183	0.13662	0.14144	0.14628	0.15113	0.15601	0.16089	0.16579
28	0.10697	0.11172	0.11650	0.12130	0.12613	0.13099	0.13586	0.14075	0.14565	0.15056	0.15549	0.16042	0.16537

TABLE 2 Future Value of a \$1 Investment

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Interest Rate

Years	4%	4.5%	5%	5.5%	6%	6.5%	7%	7.5%	8%	8.5%	9%	9.5%	10%
1	1.0400	1.0450	1.0500	1.0550	1.0600	1.0650	1.0700	1.0750	1.0800	1.0850	1.0900	1.0950	1.1000
2	1.0816	1.0920	1.1025	1.1130	1.1236	1.1342	1.1449	1.1556	1.1664	1.1772	1.1881	1.1990	1.2100
3	1.1249	1.1412	1.1576	1.1742	1.1910	1.2079	1.2250	1.2423	1.2597	1.2773	1.2950	1.3129	1.3310
4	1.1699	1.1925	1.2155	1.2388	1.2625	1.2865	1.3108	1.3355	1.3605	1.3859	1.4116	1.4377	1.4641
5	1.2167	1.2462	1.2763	1.3070	1.3382	1.3701	1.4026	1.4356	1.4693	1.5037	1.5386	1.5742	1.6105
6	1.2653	1.3023	1.3401	1.3788	1.4185	1.4591	1.5007	1.5433	1.5869	1.6315	1.6771	1.7238	1.7716
7	1.3159	1.3609	1.4071	1.4547	1.5036	1.5540	1.6058	1.6590	1.7138	1.7701	1.8280	1.8876	1.9487
8	1.3686	1.4221	1.4775	1.5347	1.5938	1.6550	1.7182	1.7835	1.8509	1.9206	1.9926	2.0669	2.1436
9	1.4233	1.4861	1.5513	1.6191	1.6895	1.7626	1.8385	1.9172	1.9990	2.0839	2.1719	2.2632	2.3579
10	1.4802	1.5530	1.6289	1.7081	1.7908	1.8771	1.9672	2.0610	2.1589	2.2610	2.3674	2.4782	2.5937
11	1.5395	1.6229	1.7103	1.8021	1.8983	1.9992	2.1049	2.2156	2.3316	2.4532	2.5804	2.7137	2.8531
12	1.6010	1.6959	1.7959	1.9012	2.0122	2.1291	2.2522	2.3818	2.5182	2.6617	2.8127	2.9715	3.1384
13	1.6651	1.7722	1.8856	2.0058	2.1329	2.2675	2.4098	2.5604	2.7196	2.8879	3.0658	3.2537	3.4523
14	1.7317	1.8519	1.9799	2.1161	2.2609	2.4149	2.5785	2.7524	2.9372	3.1334	3.3417	3.5629	3.7975
15	1.8009	1.9353	2.0789	2.2325	2.3966	2.5718	2.7590	2.9589	3.1722	3.3997	3.6425	3.9013	4.1772
16	1.8730	2.0224	2.1829	2.3553	2.5404	2.7390	2.9522	3.1808	3.4259	3.6887	3.9703	4.2719	4.5950
17	1.9479	2.1134	2.2920	2.4848	2.6928	2.9170	3.1588	3.4194	3.7000	4.0023	4.3276	4.6778	5.0545
18	2.0258	2.2085	2.4066	2.6215	2.8543	3.1067	3.3799	3.6758	3.9960	4.3425	4.7171	5.1222	5.5599
19	2.1068	2.3079	2.5270	2.7656	3.0256	3.3086	3.6165	3.9515	4.3157	4.7116	5.1417	5.6088	6.1159
20	2.1911	2.4117	2.6533	2.9178	3.2071	3.5236	3.8697	4.2479	4.6610	5.1120	5.6044	6.1416	6.7275
21	2.2788	2.5202	2.7860	3.0782	3.3996	3.7527	4.1406	4.5664	5.0338	5.5466	6.1088	6.7251	7.4002
22	2.3699	2.6337	2.9253	3.2475	3.6035	3.9966	4.4304	4.9089	5.4365	6.0180	6.6586	7.3639	8.1403
23	2.4647	2.7522	3.0715	3.4262	3.8197	4.2564	4.7405	5.2771	5.8715	6.5296	7.2579	8.0635	8.9543
24	2.5633	2.8760	3.2251	3.6146	4.0489	4.5331	5.0724	5.6729	6.3412	7.0846	7.9111	8.8296	9.8497
25	2.6658	3.0054	3.3864	3.8134	4.2919	4.8277	5.4274	6.0983	6.8485	7.6868	8.6231	9.6684	10.8347
30	3.2434	3.7453	4.3219	4.9840	5.7435	6.6144	7.6123	8.7550	10.0627	11.5583	13.2677	15.2203	17.4494
35	3.9461	4.6673	5.5180	6.5138	7.6861	9.0623	10.6766	12.5689	14.7853	17.3798	20.4140	23.9604	28.1024
40	4.8010	5.8164	7.0400	8.5133	10.2857	12.4161	14.9745	18.0442	21.7245	26.1330	31.4084	37.7194	45.2593

TABLE 2 Future Value of a \$1 Investment (Continued)

Interest Rate

Years	10.5%	11%	11.5%	12%	12.5%	13%	13.5%	14%	14.5%	15%	15.5%	16%	16.5%
1	1.1050	1.1100	1.1150	1.1200	1.1250	1.1300	1.1350	1.1400	1.1450	1.1500	1.1550	1.1600	1.1650
2	1.2210	1.2321	1.2432	1.2544	1.2656	1.2769	1.2882	1.2996	1.3110	1.3225	1.3340	1.3456	1.3572
3	1.3492	1.3676	1.3862	1.4049	1.4238	1.4429	1.4621	1.4815	1.5011	1.5209	1.5408	1.5609	1.5812
4	1.4909	1.5181	1.5456	1.5735	1.6018	1.6305	1.6595	1.6890	1.7188	1.7490	1.7796	1.8106	1.8421
5	1.6474	1.6851	1.7234	1.7623	1.8020	1.8424	1.8836	1.9254	1.9680	2.0114	2.0555	2.1003	2.1460
6	1.8204	1.8704	1.9215	1.9738	2.0273	2.0820	2.1378	2.1950	2.2534	2.3131	2.3741	2.4364	2.5001
7	2.0116	2.0762	2.1425	2.2107	2.2807	2.3526	2.4264	2.5023	2.5801	2.6600	2.7420	2.8262	2.9126
8	2.2228	2.3045	2.3889	2.4760	2.5658	2.6584	2.7540	2.8526	2.9542	3.0590	3.1671	3.2784	3.3932
9	2.4562	2.5580	2.6636	2.7731	2.8865	3.0040	3.1258	3.2519	3.3826	3.5179	3.6580	3.8030	3.9531
10	2.7141	2.8394	2.9699	3.1058	3.2473	3.3946	3.5478	3.7072	3.8731	4.0456	4.2249	4.4114	4.6053
11	2.9991	3.1518	3.3115	3.4785	3.6532	3.8359	4.0267	4.2262	4.4347	4.6524	4.8798	5.1173	5.3652
12	3.3140	3.4985	3.6923	3.8960	4.1099	4.3345	4.5704	4.8179	5.0777	5.3503	5.6362	5.9360	6.2504
13	3.6619	3.8833	4.1169	4.3635	4.6236	4.8980	5.1874	5.4924	5.8140	6.1528	6.5098	6.8858	7.2818
14	4.0464	4.3104	4.5904	4.8871	5.2016	5.5348	5.8877	6.2613	6.6570	7.0757	7.5188	7.9875	8.4833
15	4.4713	4.7846	5.1183	5.4736	5.8518	6.2543	6.6825	7.1379	7.6222	8.1371	8.6842	9.2655	9.8830
16	4.9408	5.3109	5.7069	6.1304	6.5833	7.0673	7.5848	8.1372	8.7275	9.3576	10.0302	10.7480	11.5137
17	5.4596	5.8951	6.3632	6.8660	7.4062	7.9861	8.6085	9.2765	9.9929	10.7613	11.5849	12.4677	13.4135
18	6.0328	6.5436	7.0949	7.6900	8.3319	9.0243	9.7707	10.5752	11.4419	12.3755	13.3806	14.4625	15.6267
19	6.6663	7.2633	7.9108	8.6128	9.3734	10.1974	11.0897	12.0557	13.1010	14.2318	15.4546	16.7765	18.2051
20	7.3662	8.0623	8.8206	9.6463	10.5451	11.5231	12.5869	13.7435	15.0006	16.3665	17.8501	19.4608	21.2089
21	8.1397	8.9492	9.8350	10.8038	11.8632	13.0211	14.2861	15.6676	17.1757	18.8215	20.6168	22.5745	24.7084
22	8.9944	9.9336	10.9660	12.1003	13.3461	14.7138	16.2147	17.8610	19.6662	21.6447	23.8124	26.1864	28.7853
23	9.9388	11.0263	12.2271	13.5523	15.0144	16.6266	18.4037	20.3616	22.5178	24.8915	27.5034	30.3762	33.5348
24	10.9823	12.2392	13.6332	15.1786	16.8912	18.7881	20.8882	23.2122	25.7829	28.6252	31.7664	35.2364	39.0681
25	12.1355	13.5855	15.2010	17.0001	19.0026	21.2305	23.7081	26.4619	29.5214	32.9190	36.6902	40.8742	45.6143
30	19.9926	22.8923	26.1967	29.9599	34.2433	39.1159	44.6556	50.9602	58.0985	66.2118	75.4153	85.8499	97.6737
35	32.9367	38.5749	45.1481	52.7996	61.7076	72.0686	84.1115	98.1002	114.3384	133.1755	155.0135	180.3141	209.8078
40	54.2614	65.0009	77.8027	93.0510	111.1990	132.7816	158.4289	188.8835	225.0191	267.8635	318.6246	378.7212	449.8182

TABLE 3 Future Value of a \$1 Annuity

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Years	Interest Rate													
	1.0%	1.5%	2.0%	2.5%	3.0%	3.5%	4.0%	4.5%	5.0%	5.5%	6.0%	6.5%	7.0%	7.5%
1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
2	2.0400	2.0450	2.0500	2.0550	2.0600	2.0650	2.0700	2.0750	2.0800	2.0850	2.0900	2.0950	2.1000	2.1000
3	3.1216	3.1370	3.1525	3.1680	3.1836	3.1992	3.2149	3.2306	3.2464	3.2622	3.2781	3.2940	3.3100	3.3100
4	4.2465	4.2782	4.3101	4.3423	4.3746	4.4072	4.4399	4.4729	4.5061	4.5395	4.5731	4.6070	4.6410	4.6410
5	5.4163	5.4707	5.5258	5.5811	5.6371	5.6936	5.7507	5.8084	5.8666	5.9254	5.9847	6.0446	6.1051	6.1051
6	6.6330	6.7169	6.8019	6.8881	6.9753	7.0637	7.1533	7.2440	7.3359	7.4290	7.5233	7.6189	7.7156	7.7156
7	7.8983	8.0192	8.1420	8.2669	8.3938	8.5229	8.6540	8.7873	8.9228	9.0605	9.2004	9.3426	9.4872	9.4872
8	9.2142	9.3800	9.5491	9.7216	9.8975	10.0769	10.2598	10.4464	10.6366	10.8306	11.0285	11.2302	11.4359	11.4359
9	10.5828	10.8021	11.0266	11.2563	11.4913	11.7319	11.9780	12.2298	12.4876	12.7512	13.0210	13.2971	13.5795	13.5795
10	12.0061	12.2882	12.5779	12.8754	13.1808	13.4944	13.8164	14.1471	14.4866	14.8351	15.1929	15.5603	15.9374	15.9374
11	13.4864	13.8412	14.2068	14.5835	14.9716	15.3716	15.7836	16.2081	16.6455	17.0961	17.5603	18.0385	18.5312	18.5312
12	15.0258	15.4840	15.9171	16.3856	16.8699	17.3707	17.8885	18.4237	18.9771	19.5492	20.1407	20.7522	21.3843	21.3843
13	16.6268	17.1599	17.7130	18.2868	18.8821	19.4998	20.1406	20.8055	21.4953	22.2109	22.9534	23.7236	24.5227	24.5227
14	18.2919	18.9321	19.5986	20.2926	21.0151	21.7673	22.5505	23.3659	24.2149	25.0989	26.0192	26.9774	27.9750	27.9750
15	20.0236	20.7841	21.5786	22.4087	23.2760	24.1822	25.1290	26.1184	27.1521	28.2323	29.3609	30.5402	31.7725	31.7725
16	21.8245	22.7193	23.6575	24.6411	25.6725	26.7540	27.8881	29.0772	30.3243	31.6320	33.0034	34.4416	35.9497	35.9497
17	23.6975	24.7417	25.8404	26.9984	28.2129	29.4930	30.8402	32.2580	33.7502	35.3207	36.9737	38.7135	40.5447	40.5447
18	25.6454	26.8551	28.1324	29.4812	30.9057	32.4101	33.9990	35.6774	37.4502	39.3230	41.3013	43.3913	45.5892	45.5892
19	27.6712	29.0636	30.5390	32.1027	33.7800	35.5167	37.3790	39.3532	41.4463	43.6654	46.0185	48.5135	51.1591	51.1591
20	29.7781	31.3714	33.0660	34.8683	36.7856	38.8253	40.9955	43.3047	45.7620	48.3770	51.1601	54.1222	57.2750	57.2750
21	31.9692	33.7831	35.7193	37.7861	39.9927	42.3490	44.8652	47.5525	50.4229	53.4891	56.7645	60.2638	64.0025	64.0025
22	34.2480	36.3034	38.5052	40.8643	43.3923	46.1016	49.0057	52.1190	55.4568	59.0356	62.8733	66.9889	71.4027	71.4027
23	36.6179	38.9370	41.4305	44.1118	46.9958	50.0982	53.4361	57.0279	60.8933	65.0537	69.5319	74.3529	79.5430	79.5430
24	39.0826	41.6892	44.5020	47.5380	50.8156	54.3546	58.1767	62.3050	66.7648	71.5832	76.7898	82.4164	88.4873	88.4873
25	41.6459	44.5652	47.7271	51.1526	54.8645	58.8877	63.2490	67.9779	73.1059	78.6678	84.7009	91.2459	98.3471	98.3471
26	44.3089	47.4007	50.8388	54.8355	59.0582	63.7499	68.4608	73.9994	79.8232	85.9375	92.5108	99.6885	107.4244	107.4244
27	47.0722	50.3966	54.0303	58.2514	63.4348	68.2437	73.8269	79.8269	86.2516	93.1688	100.7017	108.6885	117.2024	117.2024
28	49.9355	53.4599	57.3820	61.6025	66.8808	72.0000	78.2516	84.8269	91.8269	99.2516	107.1017	115.4885	124.4244	124.4244
29	52.8988	56.5933	60.6025	65.0025	70.0000	75.0000	81.2516	88.2516	95.2516	103.2516	111.2516	119.2516	128.2516	128.2516
30	55.9621	59.8066	63.8025	68.4025	74.0000	80.0000	87.2516	94.2516	102.2516	110.2516	118.2516	126.2516	135.2516	135.2516
31	59.1254	63.0000	67.2025	72.0000	78.0000	85.0000	93.2516	101.2516	110.2516	119.2516	128.2516	137.2516	147.2516	147.2516
32	62.3887	66.5000	70.8025	75.8000	82.0000	89.0000	98.2516	107.2516	117.2516	127.2516	137.2516	147.2516	158.2516	158.2516
33	65.7520	70.0000	74.4025	79.4000	86.0000	94.0000	104.2516	114.2516	125.2516	136.2516	147.2516	158.2516	170.2516	170.2516
34	69.2153	73.6000	78.2025	83.2000	90.0000	99.0000	110.2516	121.2516	133.2516	145.2516	157.2516	170.2516	183.2516	183.2516
35	72.7786	77.2000	81.8025	86.8000	94.0000	104.0000	116.2516	128.2516	141.2516	154.2516	168.2516	183.2516	198.2516	198.2516
36	76.4419	81.0000	85.6025	90.6000	99.0000	110.0000	123.2516	136.2516	150.2516	164.2516	179.2516	195.2516	212.2516	212.2516
37	80.2052	84.8000	89.4025	94.4000	104.0000	116.0000	130.2516	144.2516	159.2516	174.2516	190.2516	208.2516	228.2516	228.2516
38	84.0685	88.8000	93.4025	98.4000	109.0000	122.0000	137.2516	152.2516	168.2516	184.2516	201.2516	220.2516	242.2516	242.2516
39	88.0318	92.8000	97.4025	102.4000	114.0000	127.0000	144.2516	160.2516	177.2516	194.2516	212.2516	232.2516	258.2516	258.2516
40	92.0951	96.8000	101.4025	106.4000	119.0000	132.0000	153.2516	169.2516	187.2516	206.2516	226.2516	248.2516	278.2516	278.2516

TABLE 3 Future Value of a \$1 Annuity (Continued)

Interest Rate														
Years	10.5%	11%	11.5%	12%	12.5%	13%	13.5%	14%	14.5%	15%	15.5%	16%	16.5%	
1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	
2	2.1050	2.1100	2.1150	2.1200	2.1250	2.1300	2.1350	2.1400	2.1450	2.1500	2.1550	2.1600	2.1650	
3	3.3260	3.3421	3.3582	3.3744	3.3906	3.4069	3.4232	3.4396	3.4560	3.4725	3.4890	3.5056	3.5222	
4	4.6753	4.7097	4.7444	4.7793	4.8145	4.8498	4.8854	4.9211	4.9571	4.9934	5.0298	5.0665	5.1034	
5	6.1662	6.2278	6.2900	6.3528	6.4163	6.4803	6.5449	6.6101	6.6759	6.7424	6.8094	6.8771	6.9455	
6	7.8136	7.9129	8.0134	8.1152	8.2183	8.3227	8.4284	8.5355	8.6439	8.7537	8.8649	8.9775	9.0915	
7	9.6340	9.7833	9.9349	10.0890	10.2456	10.4047	10.5663	10.7305	10.8973	11.0668	11.2390	11.4139	11.5915	
8	11.6456	11.8594	12.0774	12.2997	12.5263	12.7573	12.9927	13.2328	13.4774	13.7268	13.9810	14.2401	14.5041	
9	13.8684	14.1640	14.4663	14.7757	15.0921	15.4157	15.7468	16.0853	16.4317	16.7858	17.1481	17.5185	17.8973	
10	16.3248	16.7220	17.1300	17.5487	17.9786	18.4197	18.8728	19.3373	19.8142	20.3037	20.8060	21.3215	21.8504	
11	19.0387	19.5614	20.0999	20.6546	21.2259	21.8143	22.4204	23.0445	23.6873	24.3493	25.0310	25.7329	26.4557	
12	22.0377	22.7132	23.4114	24.1331	24.8791	25.6502	26.4471	27.2707	28.1220	29.0017	29.9108	30.8502	31.8209	
13	25.3517	26.2116	27.1037	28.0291	28.9890	29.9847	31.0175	32.0887	33.1997	34.3519	35.5469	36.7862	38.0713	
14	29.0136	30.0949	31.2207	32.3926	33.6126	34.8827	36.2048	37.5811	39.0136	40.5047	42.0567	43.6720	45.3531	
15	33.0600	34.4054	35.8110	37.2797	38.8142	40.4175	42.0925	43.8424	45.6708	47.5804	49.5755	51.6595	53.8384	
16	37.5313	39.1899	40.9293	42.7533	44.6660	46.6717	48.7750	50.9804	53.2928	55.7175	58.2597	60.9250	63.7194	
17	42.4721	44.5008	46.6362	48.8837	51.2493	53.7391	56.3596	59.1178	62.0203	65.0751	68.2899	71.6730	75.2331	
18	47.9317	50.3959	52.9993	55.7497	58.6554	61.7251	64.9681	68.3941	72.0132	75.8364	79.8749	84.1407	88.6465	
19	53.9645	56.9395	60.0942	63.4397	66.9873	70.7494	74.7388	78.9692	83.4551	88.2118	93.2555	98.6032	104.2732	
20	60.6308	64.2028	68.0051	72.0524	76.3608	80.9468	85.8286	91.0249	96.5561	102.4436	108.7101	115.3797	122.4783	
21	67.9970	72.2651	76.8257	81.6987	86.9058	92.4699	98.4154	104.7684	111.5568	118.8101	126.5601	134.8405	143.6872	
22	76.1367	81.2143	86.8606	92.5028	98.7691	105.4910	112.7015	120.4360	128.7325	137.6316	147.1769	157.4150	168.3956	
23	85.1311	91.1479	97.6266	104.6029	112.1152	120.2048	128.9162	138.2970	148.3987	159.2764	170.9894	183.6014	197.1809	
24	95.0699	102.1742	109.8536	118.1552	127.1296	136.8315	147.3199	158.6586	170.9165	184.1678	198.4927	213.9776	230.7157	
25	106.0522	114.4133	123.4888	133.3339	144.0208	155.6196	168.2081	181.8708	196.6994	212.7930	230.2591	249.2140	269.7838	
30	180.8815	199.0209	219.1014	241.3327	265.9484	293.1992	323.3748	356.7868	393.7825	434.7451	480.0988	530.3117	585.9014	
35	304.1588	341.5896	383.8782	431.6635	485.6604	546.8808	615.6404	693.5727	781.6440	881.1702	993.6353	1120.7130	1284.2895	
40	507.2516	581.8261	667.8496	767.0914	881.5920	1013.7042	1166.1401	1342.0251	1544.9596	1779.0903	2049.1913	2360.7572	2720.1102	

TABLE 4 Present Value of a \$1 Lump Sum

Interest Rate

Years	4%	4.5%	5%	5.5%	6%	6.5%	7%	7.5%	8%	8.5%	9%	9.5%	10%
1	0.96154	0.95694	0.95238	0.94787	0.94340	0.93897	0.93458	0.93023	0.92593	0.92168	0.91743	0.91324	0.90909
2	0.92458	0.91573	0.90703	0.89845	0.89000	0.88166	0.87344	0.86533	0.85734	0.84946	0.84168	0.83401	0.82645
3	0.88900	0.87630	0.86384	0.85161	0.83962	0.82785	0.81630	0.80496	0.79383	0.78291	0.77218	0.76165	0.75131
4	0.85480	0.83856	0.82270	0.80722	0.79209	0.77732	0.76290	0.74880	0.73503	0.72157	0.70843	0.69557	0.68301
5	0.82193	0.80245	0.78353	0.76513	0.74726	0.72988	0.71299	0.69656	0.68058	0.66505	0.64993	0.63523	0.62092
6	0.79031	0.76790	0.74622	0.72525	0.70496	0.68533	0.66634	0.64796	0.63017	0.61295	0.59627	0.58012	0.56447
7	0.75992	0.73483	0.71068	0.68744	0.66506	0.64351	0.62275	0.60275	0.58349	0.56493	0.54703	0.52979	0.51316
8	0.73069	0.70319	0.67684	0.65160	0.62741	0.60423	0.58201	0.56070	0.54027	0.52067	0.50187	0.48382	0.46651
9	0.70259	0.67290	0.64461	0.61763	0.59190	0.56735	0.54393	0.52158	0.50025	0.47988	0.46043	0.44185	0.42410
10	0.67556	0.64393	0.61391	0.58543	0.55839	0.53273	0.50835	0.48519	0.46319	0.44229	0.42241	0.40351	0.38554
11	0.64958	0.61620	0.58468	0.55491	0.52679	0.50021	0.47509	0.45134	0.42888	0.40764	0.38753	0.36851	0.35049
12	0.62460	0.58966	0.55684	0.52598	0.49697	0.46968	0.44401	0.41985	0.39711	0.37570	0.35553	0.33654	0.31863
13	0.60057	0.56427	0.53032	0.49858	0.46884	0.44102	0.41496	0.39056	0.36770	0.34627	0.32618	0.30734	0.28966
14	0.57748	0.53997	0.50507	0.47257	0.44230	0.41410	0.38782	0.36331	0.34046	0.31914	0.29925	0.28067	0.26333
15	0.55528	0.51672	0.48102	0.44793	0.41727	0.38883	0.36245	0.33797	0.31524	0.29414	0.27454	0.25632	0.23939
16	0.53391	0.49447	0.45811	0.42458	0.39365	0.36510	0.33873	0.31439	0.29189	0.27110	0.25187	0.23409	0.21763
17	0.51337	0.47318	0.43630	0.40245	0.37136	0.34281	0.31657	0.29245	0.27027	0.24986	0.23107	0.21378	0.19784
18	0.49363	0.45280	0.41552	0.38147	0.35034	0.32189	0.29586	0.27205	0.25025	0.23028	0.21199	0.19523	0.17986
19	0.47464	0.43330	0.39573	0.36158	0.33051	0.30224	0.27651	0.25307	0.23171	0.21224	0.19449	0.17829	0.16351
20	0.45639	0.41464	0.37689	0.34273	0.31180	0.28380	0.25842	0.23541	0.21455	0.19562	0.17843	0.16282	0.14864
21	0.43883	0.39679	0.35894	0.32486	0.29418	0.26648	0.24151	0.21899	0.19866	0.18029	0.16370	0.14870	0.13513
22	0.42196	0.37970	0.34185	0.30793	0.27751	0.25021	0.22571	0.20371	0.18394	0.16617	0.15018	0.13580	0.12285
23	0.40573	0.36335	0.32557	0.29187	0.26180	0.23494	0.21095	0.18950	0.17032	0.15315	0.13778	0.12402	0.11168
24	0.39012	0.34770	0.31007	0.27666	0.24698	0.22060	0.19715	0.17628	0.15770	0.14115	0.12640	0.11326	0.10153
25	0.37512	0.33273	0.29530	0.26223	0.23300	0.20714	0.18425	0.16398	0.14602	0.13009	0.11597	0.10343	0.09230
30	0.30832	0.26700	0.23138	0.20084	0.17411	0.15119	0.13137	0.11422	0.09938	0.08652	0.07537	0.06570	0.05731
35	0.25342	0.21425	0.18129	0.15352	0.13011	0.11035	0.09366	0.07958	0.06763	0.05754	0.04899	0.04174	0.03588
40	0.20829	0.17193	0.14205	0.11746	0.09722	0.08054	0.06678	0.05542	0.04603	0.03827	0.03184	0.02651	0.02209

TABLE 4 Present Value of a \$1 Lump Sum (Continued)

Interest Rate

Years	10.5%	11%	11.5%	12%	12.5%	13%	13.5%	14%	14.5%	15%	15.5%	16%	16.5%
1	0.90498	0.90090	0.89686	0.89286	0.88889	0.88496	0.88106	0.87719	0.87336	0.86957	0.86580	0.86207	0.85837
2	0.81896	0.81162	0.80436	0.79719	0.79012	0.78315	0.77626	0.76947	0.76276	0.75614	0.74961	0.74318	0.73680
3	0.74116	0.73119	0.72140	0.71178	0.70233	0.69305	0.68393	0.67497	0.66617	0.65752	0.64901	0.64066	0.63244
4	0.67073	0.65873	0.64699	0.63552	0.62430	0.61332	0.60258	0.59208	0.58181	0.57175	0.56192	0.55229	0.54287
5	0.60700	0.59345	0.58026	0.56743	0.55493	0.54276	0.53091	0.51937	0.50813	0.49718	0.48651	0.47611	0.46598
6	0.54932	0.53464	0.52042	0.50663	0.49327	0.48032	0.46778	0.45559	0.44378	0.43233	0.42122	0.41044	0.39999
7	0.49712	0.48166	0.46674	0.45235	0.43846	0.42506	0.41213	0.39964	0.38758	0.37594	0.36469	0.35383	0.34334
8	0.44989	0.43393	0.41860	0.40388	0.38974	0.37616	0.36311	0.35056	0.33850	0.32690	0.31575	0.30503	0.29471
9	0.40714	0.39092	0.37543	0.36061	0.34644	0.33288	0.31992	0.30751	0.29563	0.28428	0.27338	0.26295	0.25297
10	0.36845	0.35218	0.33671	0.32197	0.30795	0.29459	0.28187	0.26974	0.25819	0.24718	0.23669	0.22668	0.21714
11	0.33344	0.31728	0.30198	0.28748	0.27373	0.26070	0.24834	0.23662	0.22550	0.21494	0.20493	0.19542	0.18639
12	0.30175	0.28584	0.27083	0.25668	0.24332	0.23071	0.21880	0.20756	0.19694	0.18691	0.17743	0.16846	0.15999
13	0.27308	0.25751	0.24290	0.22917	0.21628	0.20416	0.19278	0.18207	0.17200	0.16253	0.15362	0.14523	0.13733
14	0.24713	0.23198	0.21785	0.20462	0.19225	0.18068	0.16985	0.15971	0.15022	0.14133	0.13300	0.12520	0.11788
15	0.22385	0.20900	0.19538	0.18270	0.17089	0.15989	0.14964	0.14010	0.13120	0.12289	0.11515	0.10793	0.10118
16	0.20240	0.18829	0.17523	0.16312	0.15190	0.14150	0.13185	0.12289	0.11458	0.10686	0.09970	0.09304	0.08685
17	0.18318	0.16963	0.15715	0.14564	0.13502	0.12522	0.11616	0.10780	0.10007	0.09293	0.08632	0.08021	0.07455
18	0.16576	0.15282	0.14095	0.13004	0.12002	0.11081	0.10235	0.09456	0.08740	0.08081	0.07474	0.06914	0.06399
19	0.15001	0.13788	0.12641	0.11611	0.10668	0.09808	0.09017	0.08295	0.07633	0.07027	0.06471	0.05961	0.05493
20	0.13575	0.12403	0.11337	0.10367	0.09483	0.08678	0.07945	0.07276	0.06666	0.06110	0.05602	0.05139	0.04715
21	0.12285	0.11174	0.10168	0.09256	0.08429	0.07680	0.07000	0.06383	0.05822	0.05313	0.04850	0.04430	0.04047
22	0.11118	0.10067	0.09119	0.08264	0.07493	0.06796	0.06167	0.05599	0.05085	0.04620	0.04199	0.03819	0.03474
23	0.10062	0.09069	0.08179	0.07379	0.06660	0.06014	0.05434	0.04911	0.04441	0.04017	0.03636	0.03292	0.02982
24	0.09106	0.08170	0.07335	0.06588	0.05920	0.05323	0.04787	0.04308	0.03879	0.03493	0.03148	0.02838	0.02560
25	0.08240	0.07381	0.06579	0.05882	0.05262	0.04710	0.04218	0.03779	0.03387	0.03038	0.02726	0.02447	0.02197
30	0.05002	0.04368	0.03817	0.03338	0.02920	0.02557	0.02239	0.01963	0.01721	0.01510	0.01326	0.01165	0.01024
35	0.03036	0.02592	0.02215	0.01894	0.01621	0.01388	0.01189	0.01019	0.00875	0.00751	0.00645	0.00555	0.00477
40	0.01843	0.01538	0.01285	0.01075	0.00899	0.00753	0.00631	0.00529	0.00444	0.00373	0.00314	0.00264	0.00222

TABLE 5 | Present Value of a \$1 Annuity

Years	Interest Rate												
	4%	4.5%	5%	5.5%	6%	6.5%	7%	7.5%	8%	8.5%	9%	9.5%	10%
1	0.9615	0.9569	0.9524	0.9479	0.9434	0.9390	0.9346	0.9302	0.9259	0.9217	0.9174	0.9132	0.9091
2	1.8861	1.8727	1.8594	1.8463	1.8334	1.8206	1.8080	1.7956	1.7833	1.7711	1.7591	1.7473	1.7355
3	2.7751	2.7490	2.7232	2.6979	2.6730	2.6485	2.6243	2.6005	2.5771	2.5540	2.5313	2.5089	2.4869
4	3.6299	3.5875	3.5460	3.5052	3.4651	3.4258	3.3872	3.3493	3.3121	3.2758	3.2397	3.2045	3.1699
5	4.4518	4.3900	4.3295	4.2703	4.2124	4.1557	4.1002	4.0459	3.9927	3.9406	3.8897	3.8397	3.7908
6	5.2421	5.1579	5.0757	4.9955	4.9173	4.8410	4.7665	4.6938	4.6229	4.5536	4.4859	4.4198	4.3553
7	6.0021	5.8927	5.7864	5.6830	5.5824	5.4845	5.3893	5.2966	5.2064	5.1185	5.0330	4.9496	4.8684
8	6.7327	6.5959	6.4632	6.3346	6.2098	6.0888	5.9713	5.8573	5.7468	5.6392	5.5348	5.4334	5.3349
9	7.4353	7.2688	7.1078	6.9522	6.8017	6.6561	6.5152	6.3789	6.2469	6.1191	5.9952	5.8753	5.7590
10	8.1109	7.9127	7.7217	7.5376	7.3601	7.1888	7.0236	6.8641	6.7101	6.5613	6.4177	6.2788	6.1448
11	8.7605	8.5289	8.3064	8.0925	7.8869	7.6890	7.4987	7.3154	7.1390	6.9690	6.8052	6.6473	6.4951
12	9.3851	9.1186	8.8633	8.6185	8.3838	8.1587	7.9427	7.7353	7.5361	7.3447	7.1607	6.9838	6.8137
13	9.9856	9.6829	9.3936	9.1171	8.8527	8.5997	8.3577	8.1258	7.9038	7.6910	7.4869	7.2912	7.1034
14	10.5631	10.2228	9.8986	9.5896	9.2950	9.0138	8.7455	8.4892	8.2442	8.0101	7.7862	7.5719	7.3667
15	11.1184	10.7395	10.3797	10.0376	9.7122	9.4027	9.1079	8.8271	8.5595	8.3042	8.0607	7.8282	7.6061
16	11.6523	11.2340	10.8378	10.4622	10.1059	9.7678	9.4466	9.1415	8.8514	8.5753	8.3126	8.0623	7.8237
17	12.1657	11.7072	11.2741	10.8646	10.4773	10.1106	9.7632	9.4340	9.1216	8.8252	8.5436	8.2760	8.0218
18	12.6593	12.1600	11.6896	11.2461	10.8276	10.4325	10.0591	9.7080	9.3719	9.0555	8.7556	8.4713	8.2014
19	13.1339	12.5933	12.0853	11.6077	11.1581	10.7347	10.3356	9.9591	9.6036	9.2677	8.9501	8.6496	8.3649
20	13.5903	13.0079	12.4622	11.9504	11.4699	11.0185	10.5940	10.1945	9.8181	9.4633	9.1285	8.8124	8.5136
21	14.0292	13.4047	12.8212	12.2752	11.7641	11.2850	10.8355	10.4135	10.0168	9.6436	9.2922	8.9611	8.6487
22	14.4511	13.7844	13.1630	12.5832	12.0416	11.5352	11.0612	10.6172	10.2007	9.8098	9.4424	9.0969	8.7715
23	14.8568	14.1478	13.4886	12.8750	12.3034	11.7701	11.2722	10.8067	10.3711	9.9629	9.5802	9.2209	8.8832
24	15.2470	14.4955	13.7886	13.1517	12.5504	11.9907	11.4693	10.9830	10.5288	10.1041	9.7066	9.3341	8.9847
25	15.6221	14.8282	14.0939	13.4139	12.7834	12.1979	11.6536	11.1489	10.6748	10.2342	9.8226	9.4376	9.0770
30	17.2920	16.2889	15.3725	14.5337	13.7648	13.0587	12.4090	11.8104	11.2578	10.7468	10.2737	9.8347	9.4269
35	18.6646	17.4610	16.3742	15.3906	14.4982	13.6870	12.9477	12.2725	11.6546	11.0878	10.5668	10.0870	9.6442
40	19.7928	18.4016	17.1591	16.0461	15.0463	14.1455	13.3317	12.5944	11.9246	11.3145	10.7574	10.2472	9.7791

TABLE 5 | Present Value of a \$1 Annuity (Continued)

Years	Interest Rate												
	10.5%	11%	11.5%	12%	12.5%	13%	13.5%	14%	14.5%	15%	15.5%	16%	16.5%
1	0.9050	0.9009	0.8969	0.8929	0.8889	0.8850	0.8811	0.8772	0.8734	0.8696	0.8658	0.8621	0.8584
2	1.7240	1.7125	1.7012	1.6901	1.6790	1.6681	1.6573	1.6467	1.6361	1.6257	1.6154	1.6052	1.5952
3	2.4651	2.4437	2.4226	2.4018	2.3813	2.3612	2.3413	2.3216	2.3023	2.2832	2.2644	2.2459	2.2276
4	3.1359	3.1024	3.0696	3.0373	3.0056	2.9745	2.9438	2.9137	2.8841	2.8550	2.8263	2.7982	2.7705
5	3.7429	3.6959	3.6499	3.6048	3.5606	3.5172	3.4747	3.4331	3.3922	3.3522	3.3129	3.2743	3.2365
6	4.2922	4.2305	4.1703	4.1114	4.0538	3.9975	3.9425	3.8887	3.8360	3.7845	3.7341	3.6847	3.6365
7	4.7893	4.7122	4.6370	4.5638	4.4923	4.4226	4.3546	4.2883	4.2236	4.1604	4.0988	4.0386	3.9798
8	5.2392	5.1461	5.0556	4.9676	4.8820	4.7988	4.7177	4.6389	4.5621	4.4873	4.4145	4.3436	4.2745
9	5.6463	5.5370	5.4311	5.3282	5.2285	5.1317	5.0377	4.9464	4.8577	4.7716	4.6879	4.6065	4.5275
10	6.0148	5.8892	5.7678	5.6502	5.5364	5.4262	5.3195	5.2161	5.1159	5.0188	4.9246	4.8332	4.7446
11	6.3482	6.2065	6.0697	5.9377	5.8102	5.6869	5.5679	5.4527	5.3414	5.2337	5.1295	5.0286	4.9310
12	6.6500	6.4924	6.3406	6.1944	6.0535	5.9176	5.7867	5.6603	5.5383	5.4206	5.3069	5.1971	5.0910
13	6.9230	6.7499	6.5835	6.4235	6.2698	6.1218	5.9794	5.8424	5.7103	5.5831	5.4605	5.3423	5.2283
14	7.1702	6.9819	6.8013	6.6282	6.4620	6.3025	6.1493	6.0021	5.8606	5.7245	5.5935	5.4675	5.3462
15	7.3938	7.1909	6.9957	6.8109	6.6329	6.4624	6.2989	6.1422	5.9918	5.8474	5.7087	5.5755	5.4474
16	7.5982	7.3792	7.1719	6.9740	6.7848	6.6039	6.4308	6.2651	6.1063	5.9542	5.8084	5.6686	5.5342
17	7.7794	7.5488	7.3291	7.1196	6.9198	6.7291	6.5469	6.3729	6.2064	6.0472	5.8947	5.7487	5.6088
18	7.9451	7.7016	7.4700	7.2497	7.0398	6.8399	6.6493	6.4674	6.2938	6.1280	5.9695	5.8178	5.6728
19	8.0952	7.8393	7.5964	7.3658	7.1465	6.9380	6.7395	6.5504	6.3701	6.1982	6.0342	5.8775	5.7277
20	8.2309	7.9633	7.7098	7.4694	7.2414	7.0248	6.8189	6.6231	6.4368	6.2593	6.0902	5.9288	5.7748
21	8.3538	8.0751	7.8115	7.5620	7.3256	7.1018	6.8889	6.6870	6.4950	6.3125	6.1387	5.9731	5.8153
22	8.4649	8.1757	7.9027	7.6446	7.4006	7.1695	6.9506	6.7429	6.5459	6.3587	6.1807	6.0113	5.8501
23	8.5656	8.2664	7.9845	7.7184	7.4672	7.2297	7.0049	6.7921	6.5903	6.3988	6.2170	6.0442	5.8799
24	8.6566	8.3481	8.0578	7.7843	7.5264	7.2829	7.0528	6.8351	6.6291	6.4338	6.2485	6.0726	5.9055
25	8.7390	8.4217	8.1236	7.8431	7.5790	7.3300	7.0950	6.8729	6.6629	6.4641	6.2758	6.0971	5.9274
30	9.0474	8.6938	8.3637	8.0552	7.7664	7.4957	7.2415	7.0027	6.7778	6.5660	6.3661	6.1772	5.9986
35	9.2347	8.8552	8.5030	8.1755	7.8704	7.5856	7.3193	7.0700	6.8362	6.6166	6.4100	6.2153	6.0317
40	9.3483	8.9511	8.5839	8.2438	7.9281	7.6344	7.3607	7.1050	6.8659	6.6418	6.4314	6.2335	6.0471