

系所組別	考試科目
資訊管理學系資訊科技組	統計學

※考生請於答案卷內作答

可使用不附有「儲存程式功能」的電子計算機 隨卷另附 Z 分配、卡方分配、F 分配等統計表

- 二項隨機變數 X 的期望值為 20 變異數為 16, 求機率 $\Pr(15 < X \leq 22)$ (10 分).
- 常態隨機變數 X 的期望值 $\mu_x = 10$ 變異數 $\sigma_x^2 = 9$, 常態隨機變數 Y 的期望值 $\mu_y = 18$ 變異數 $\sigma_y^2 = 4$. 在 10 與 18 之間有一 k 值, (i)求 k 值使得機率 $\Pr(X > k) = \Pr(Y < k)$ 成立(10 分), (ii)並問此共同機率值為何(5 分)?
- 某農場生產蕃茄, 根據過去的歷史資料得知蕃茄的重量呈現均勻分配 $U(30g, 50g)$, (i)由該農場隨機抽取 48 個蕃茄, 試求總重量會不足 1980g 的機率(5 分), (ii)欲使蕃茄總重量超過 1980g 的機率大於 0.99, 則至少應該抽取幾個蕃茄(10 分)?
- 彼此獨立的常態隨機變數 $X_1, X_2, \dots, X_n, X_i \sim N(\theta, \sigma_i^2) (i = 1, 2, \dots, n)$ 它們的共同期望值 θ 為一個未知參數, (i)當變異數 $\sigma_1^2, \sigma_2^2, \dots, \sigma_n^2$ 皆為已知但不全相等時, 求 θ 的最大概似估計量 $\hat{\theta}$ (Maximum Likelihood Estimator)(10 分), (ii)當變異數 $\sigma_1^2, \sigma_2^2, \dots, \sigma_n^2$ 皆為已知而且彼此相等時, 再求 θ 的最大概似估計量 $\hat{\theta}$ (5 分).
- 某罐頭食品的產品不良率設為 p , 欲檢定 $H_0: p \geq 9\%$ vs. $H_1: p < 9\%$. (i)若隨機抽取 100 個罐頭加以檢驗, 發現其中有 5 個是不良品. 在顯著水準 $\alpha = 0.05$ 之下, 是否該拒絕 H_0 (5 分)? 將 α 調整為 0.1, 此時又是否該拒絕 H_0 (5 分)? (ii)若隨機抽取 400 個罐頭加以檢驗, 發現其中有 20 個是不良品, 在 $\alpha = 0.05$ 之下, 是否該拒絕 H_0 (5 分)?
- 數學科有五道四選一的單選題, 某班六十四位學生的答題結果如下:

答對題數	0 題	1 題	2 題	3 題	4 題	5 題
答對人數	14 人	24 人	16 人	4 人	5 人	1 人

當顯著水準 $\alpha = 0.05$ 時, 是否該拒絕虛無假設 H_0 : 這一班學生不用功沒唸書全部用隨機亂猜的方式作答(15 分, 提示: 考慮 $n = 5, p = 0.25$ 的二項分配)?

7. 假設雞蛋的重量呈現常態分配, 從甲、乙、丙三所農場隨機抽取 6 個、5 個、4 個雞蛋, 測得其重量(公克)如下:

甲農場 68 70 70 71 82 74
 乙農場 83 72 73 87 63
 丙農場 71 64 68 79

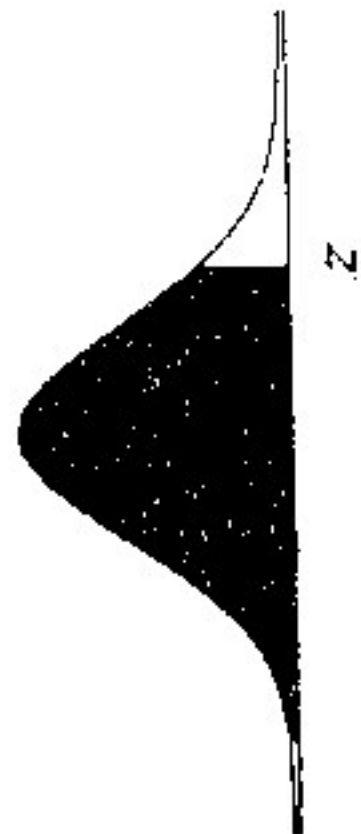
- 當這三個常態分配的標準差皆為 7 公克時, 試以顯著水準 $\alpha = 0.05$ 檢定這三所農場的雞蛋平均重量是否有差異(10 分)?
- 當這三個常態分配的標準差皆未知但彼此相等時, 試以顯著水準 $\alpha = 0.05$ 檢定這三所農場的雞蛋平均重量是否有差異(5 分)?

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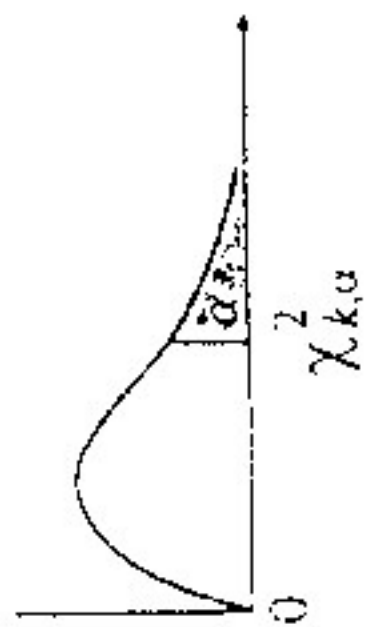
常態分配表

$$\Phi(z) = P(Z \leq z) = \int_{-\infty}^z \frac{1}{\sqrt{2\pi}} e^{-\frac{z^2}{2}} dx$$



卡方分配表

$$P(\chi_k^2 \geq \chi_{k,\alpha}^2) = \alpha$$



Z 的小數點第二位																		
Z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09								
0.0	0.5000	0.5040	0.5080	0.5120	0.5160	0.5199	0.5239	0.5279	0.5319	0.5359								
0.1	0.5398	0.5438	0.5478	0.5517	0.5557	0.5596	0.5636	0.5675	0.5714	0.5753								
0.2	0.5793	0.5832	0.5871	0.5910	0.5948	0.5987	0.6026	0.6064	0.6103	0.6141								
0.3	0.6179	0.6217	0.6255	0.6293	0.6331	0.6368	0.6406	0.6443	0.6480	0.6517								
0.4	0.6554	0.6591	0.6628	0.6664	0.6700	0.6736	0.6772	0.6808	0.6844	0.6879								
0.5	0.6915	0.6950	0.6985	0.7019	0.7054	0.7088	0.7123	0.7157	0.7190	0.7224								
0.6	0.7257	0.7291	0.7324	0.7357	0.7389	0.7422	0.7454	0.7486	0.7517	0.7549								
0.7	0.7580	0.7611	0.7642	0.7673	0.7704	0.7734	0.7764	0.7794	0.7823	0.7852								
0.8	0.7881	0.7910	0.7939	0.7967	0.7995	0.8023	0.8051	0.8078	0.8106	0.8133								
0.9	0.8159	0.8186	0.8212	0.8238	0.8264	0.8289	0.8315	0.8340	0.8365	0.8389								
1.0	0.8413	0.8438	0.8461	0.8485	0.8508	0.8531	0.8554	0.8577	0.8599	0.8621								
1.1	0.8643	0.8665	0.8686	0.8708	0.8729	0.8749	0.8770	0.8790	0.8810	0.8830								
1.2	0.8849	0.8869	0.8888	0.8907	0.8925	0.8944	0.8962	0.8980	0.8997	0.9015								
1.3	0.9032	0.9049	0.9066	0.9082	0.9099	0.9115	0.9131	0.9147	0.9162	0.9177								
1.4	0.9192	0.9207	0.9222	0.9236	0.9251	0.9265	0.9279	0.9292	0.9306	0.9319								
1.5	0.9332	0.9345	0.9357	0.9370	0.9382	0.9394	0.9406	0.9418	0.9429	0.9441								
1.6	0.9452	0.9463	0.9474	0.9484	0.9495	0.9505	0.9515	0.9525	0.9535	0.9545								
1.7	0.9554	0.9564	0.9573	0.9582	0.9591	0.9599	0.9608	0.9616	0.9625	0.9633								
1.8	0.9641	0.9649	0.9656	0.9664	0.9671	0.9678	0.9686	0.9693	0.9699	0.9706								
1.9	0.9713	0.9719	0.9726	0.9732	0.9738	0.9744	0.9750	0.9756	0.9761	0.9767								
2.0	0.9772	0.9778	0.9783	0.9788	0.9793	0.9798	0.9803	0.9808	0.9812	0.9817								
2.1	0.9821	0.9826	0.9830	0.9834	0.9838	0.9842	0.9846	0.9850	0.9854	0.9857								
2.2	0.9861	0.9864	0.9868	0.9871	0.9875	0.9878	0.9881	0.9884	0.9887	0.9890								
2.3	0.9893	0.9896	0.9898	0.9901	0.9904	0.9906	0.9909	0.9911	0.9913	0.9916								
2.4	0.9918	0.9920	0.9922	0.9925	0.9927	0.9929	0.9931	0.9932	0.9934	0.9936								
2.5	0.9938	0.9940	0.9941	0.9943	0.9945	0.9946	0.9948	0.9949	0.9951	0.9952								
2.6	0.9953	0.9955	0.9956	0.9957	0.9959	0.9960	0.9961	0.9962	0.9963	0.9964								
2.7	0.9965	0.9966	0.9967	0.9968	0.9969	0.9970	0.9971	0.9972	0.9973	0.9974								
2.8	0.9974	0.9975	0.9976	0.9977	0.9977	0.9978	0.9979	0.9979	0.9980	0.9981								
2.9	0.9981	0.9982	0.9982	0.9983	0.9984	0.9984	0.9985	0.9985	0.9986	0.9986								
3.0	0.9987	0.9987	0.9987	0.9988	0.9988	0.9988	0.9989	0.9989	0.9990	0.9990								
3.1	0.9990	0.9991	0.9991	0.9991	0.9992	0.9992	0.9992	0.9992	0.9993	0.9993								
3.2	0.9993	0.9993	0.9994	0.9994	0.9994	0.9994	0.9994	0.9995	0.9995	0.9995								
3.3	0.9995	0.9995	0.9995	0.9996	0.9996	0.9996	0.9996	0.9996	0.9997	0.9997								
3.4	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9998								
3.5	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998								
3.6	0.9998	0.9998	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999								
3.7	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999								
3.8	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999								
3.9	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000								
4.0	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000								

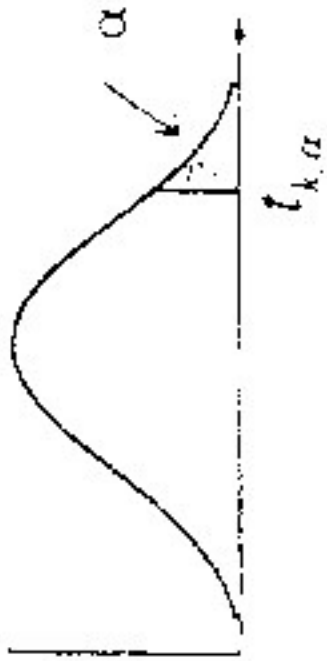
自由度	單尾顯著水準					
	0.99	0.975	0.95	0.9	0.1	0.01
1	0.0002	0.0010	0.0039	0.0158	2.7055	6.6349
2	0.0201	0.0506	0.1026	0.2107	4.6052	9.2103
3	0.1148	0.2158	0.3518	0.5844	6.2514	11.3449
4	0.2971	0.4844	0.7107	1.0636	7.7794	13.2767
5	0.5543	0.8312	1.1455	1.6103	9.2364	15.0863
6	0.8721	1.2373	1.6354	2.2041	10.6446	16.8119
7	1.2390	1.6899	2.1674	2.8331	12.0170	18.4753
8	1.6465	2.1797	2.7326	3.4895	13.3616	20.0902
9	2.0879	2.7004	3.3251	4.1682	14.6837	21.6660
10	2.5582	3.2470	3.9403	4.8652	15.9872	23.2093
11	3.0535	3.8158	4.5748	5.5778	17.2750	24.7250
12	3.5706	4.4038	5.2260	6.3038	18.5494	26.2170
13	4.1069	5.0087	5.8919	7.0415	19.8119	27.6883
14	4.6604	5.6287	6.5706	7.7895	21.0642	29.1413
15	5.2294	6.2621	7.2609	8.5468	22.3072	30.5779
16	5.8122	6.9077	7.9616	9.3122	23.5418	31.9997
17	6.4078	7.5642	8.6718	10.0852	24.7690	33.4087
18	7.0149	8.2306	9.3905	10.8649	25.9894	34.8053
19	7.6327	8.9068	10.1170	11.6509	27.2036	36.1908
20	8.2604	9.5908	10.8508	12.4426	28.4120	37.5662
21	8.8972	10.2829	11.5913	13.2396	29.6151	38.9321
22	9.5425	10.9823	12.3380	14.0415	30.8133	40.2894
23	10.1957	11.6885	13.0905	14.8479	32.0069	41.6384
24	10.8564	12.4012	13.8484	15.6587	33.1963	42.9798
25	11.5240	13.1197	14.6114	16.4734	34.3816	44.3141
26	12.1981	13.8439	15.3791	17.2919	35.5631	45.6417
27	12.8786	14.5733	16.1513	18.1138	36.7412	46.9630
28	13.5648	15.3079	16.9279	18.9392	37.9159	48.2782
29	14.2565	16.0471	17.7083	19.7677	39.0875	49.5879
30	14.9535	16.7908	18.4926	20.5992	40.2560	50.8922
35	18.5089	20.5694	22.4650	24.7967	46.0588	57.3421
40	22.1643	24.4331	26.5093	29.0505	51.8050	63.6907
45	25.9013	28.3662	30.6123	33.3504	57.5053	69.9568
50	29.7067	32.3574	34.7642	37.6886	63.1671	76.1539
60	37.4849	40.4817	43.1879	46.4589	74.3970	88.3794
70	45.4418	48.7576	51.7393	55.3290	85.5271	100.4252
80	53.5400	57.1532	60.3915	64.2778	96.5782	112.3288
90	61.7541	65.6466	69.1260	73.2912	107.5650	124.1163
100	70.0648	74.2219	77.9295	82.3581	118.4980	135.8067
200	156.4320	162.7280	168.2786	174.8353	226.0210	249.4451
300	245.9725	253.9123	260.8781	269.0679	331.7885	359.9064
400	337.1553	346.4818	354.6410	364.2074	436.6490	468.7245

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t分配表

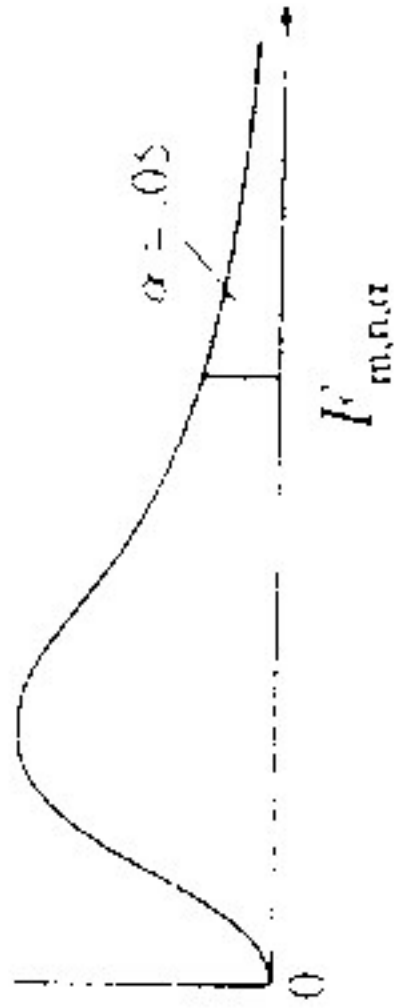
$P(t_k \geq t_{k\alpha}) = \alpha$



自由度	單尾顯著水準									
	0.1	0.05	0.025	0.01	0.005	0.0025	0.001	0.0005	0.00025	0.0001
1	3.0777	6.3138	12.7062	31.8205	63.6567	127.3213	318.3086			
2	1.8856	2.9200	4.3027	6.9646	9.9248	14.0890	22.3271			
3	1.6377	2.3534	3.1824	4.5407	5.8409	7.4533	10.2145			
4	1.5332	2.1318	2.7764	3.7469	4.6041	5.5976	7.1732			
5	1.4759	2.0150	2.5706	3.3649	4.0321	4.7733	5.8934			
6	1.4398	1.9432	2.4469	3.1427	3.7074	4.3168	5.2076			
7	1.4149	1.8946	2.3646	2.9980	3.4995	4.0293	4.7853			
8	1.3968	1.8595	2.3060	2.8965	3.3554	3.8325	4.5008			
9	1.3830	1.8331	2.2622	2.8214	3.2498	3.6897	4.2968			
10	1.3722	1.8125	2.2281	2.7638	3.1693	3.5814	4.1437			
11	1.3634	1.7959	2.2010	2.7181	3.1058	3.4966	4.0247			
12	1.3562	1.7823	2.1788	2.6810	3.0545	3.4284	3.9296			
13	1.3502	1.7709	2.1604	2.6503	3.0123	3.3725	3.8520			
14	1.3450	1.7613	2.1448	2.6245	2.9768	3.3257	3.7874			
15	1.3406	1.7531	2.1314	2.6025	2.9467	3.2860	3.7328			
16	1.3368	1.7459	2.1199	2.5835	2.9208	3.2520	3.6862			
17	1.3334	1.7396	2.1098	2.5669	2.8982	3.2224	3.6458			
18	1.3304	1.7341	2.1009	2.5524	2.8784	3.1966	3.6105			
19	1.3277	1.7291	2.0930	2.5395	2.8609	3.1737	3.5794			
20	1.3253	1.7247	2.0860	2.5280	2.8453	3.1534	3.5518			
21	1.3232	1.7207	2.0796	2.5176	2.8314	3.1352	3.5272			
22	1.3212	1.7171	2.0739	2.5083	2.8188	3.1188	3.5050			
23	1.3195	1.7139	2.0687	2.4999	2.8073	3.1040	3.4850			
24	1.3178	1.7109	2.0639	2.4922	2.7969	3.0905	3.4668			
25	1.3163	1.7081	2.0595	2.4851	2.7874	3.0782	3.4502			
26	1.3150	1.7056	2.0555	2.4786	2.7787	3.0669	3.4350			
27	1.3137	1.7033	2.0518	2.4727	2.7707	3.0565	3.4210			
28	1.3125	1.7011	2.0484	2.4671	2.7633	3.0469	3.4082			
29	1.3114	1.6991	2.0452	2.4620	2.7564	3.0380	3.3962			
30	1.3104	1.6973	2.0423	2.4573	2.7500	3.0298	3.3852			
35	1.3062	1.6896	2.0301	2.4377	2.7238	2.9960	3.3400			
40	1.3031	1.6839	2.0211	2.4233	2.7045	2.9712	3.3069			
45	1.3006	1.6794	2.0141	2.4121	2.6896	2.9521	3.2815			
50	1.2987	1.6759	2.0086	2.4033	2.6778	2.9370	3.2614			
60	1.2958	1.6706	2.0003	2.3901	2.6603	2.9146	3.2317			
70	1.2938	1.6669	1.9944	2.3808	2.6479	2.8987	3.2108			
80	1.2922	1.6641	1.9901	2.3739	2.6387	2.8870	3.1953			
90	1.2910	1.6620	1.9867	2.3685	2.6316	2.8779	3.1833			
100	1.2901	1.6602	1.9840	2.3642	2.6259	2.8707	3.1737			
200	1.2858	1.6525	1.9719	2.3451	2.6006	2.8385	3.1315			
300	1.2844	1.6499	1.9679	2.3388	2.5923	2.8279	3.1176			
400	1.2837	1.6487	1.9659	2.3357	2.5882	2.8227	3.1107			
500	1.2832	1.6479	1.9647	2.3338	2.5857	2.8195	3.1066			
600	1.2830	1.6474	1.9639	2.3326	2.5840	2.8175	3.1039			
700	1.2828	1.6470	1.9634	2.3317	2.5829	2.8160	3.1019			
800	1.2826	1.6468	1.9629	2.3310	2.5820	2.8148	3.1005			
900	1.2825	1.6465	1.9626	2.3305	2.5817	2.8140	3.0993			
1000	1.2824	1.6464	1.9623	2.3301	2.5808	2.8133	3.0984			

F分配表(續3)

$\alpha=0.05$



分子自由度 m										分母自由度 n									
1	2	3	4	5	6	7	8	9		1	2	3	4	5	6	7	8	9	
1	161.448	199.500	235.767	274.583	310.162	333.986	356.768	378.883	240.543	1	16.013	14.013	12.591	11.591	10.845	10.251	9.773	9.388	9.054
2	18.5128	19.0000	19.1643	19.2468	19.2964	19.3295	19.3532	19.3710	19.3848	2	10.1280	9.5521	9.2766	9.1172	8.9135	8.7406	8.5867	8.4522	8.3348
3	10.1280	9.5521	9.2766	9.1172	8.9135	8.7406	8.5867	8.4522	8.3348	3	7.7086	6.9443	6.5914	6.3882	6.2561	6.1631	6.0942	6.0410	5.9988
4	7.7086	6.9443	6.5914	6.3882	6.2561	6.1631	6.0942	6.0410	5.9988	4	6.6079	5.7861	5.4095	5.1922	5.0503	4.9503	4.8759	4.8183	4.7725
5	6.6079	5.7861	5.4095	5.1922	5.0503	4.9503	4.8759	4.8183	4.7725	5	5.9874	5.1433	4.7571	4.5337	4.3874	4.2839	4.2067	4.1468	4.0990
6	5.9874	5.1433	4.7571	4.5337	4.3874	4.2839	4.2067	4.1468	4.0990	6	5.5914	4.7374	4.3468	4.1203	3.9715	3.8660	3.7870	3.7257	3.6767
7	5.5914	4.7374	4.3468	4.1203	3.9715	3.8660	3.7870	3.7257	3.6767	7	5.3177	4.4590	4.0662	3.8379	3.6875	3.5806	3.5005	3.4381	3.3881
8	5.3177	4.4590	4.0662	3.8379	3.6875	3.5806	3.5005	3.4381	3.3881	8	5.1174	4.2565	3.8625	3.6331	3.4817	3.3738	3.2927	3.2296	3.1789
9	5.1174	4.2565	3.8625	3.6331	3.4817	3.3738	3.2927	3.2296	3.1789	9	4.9646	4.1028	3.7083	3.4780	3.3258	3.2172	3.1355	3.0717	3.0204
10	4.9646	4.1028	3.7083	3.4780	3.3258	3.2172	3.1355	3.0717	3.0204	10	4.8443	3.9823	3.5874	3.3567	3.2039	3.0946	3.0123	2.9480	2.8962
11	4.8443	3.9823	3.5874	3.3567	3.2039	3.0946	3.0123	2.9480	2.8962	11	4.7472	3.8853	3.4903	3.2592	3.1059	2.9961	2.9134	2.8486	2.7964
12	4.7472	3.8853	3.4903	3.2592	3.1059	2.9961	2.9134	2.8486	2.7964	12	4.6672	3.8056	3.4105	3.1791	3.0254	2.9153	2.8321	2.7669	2.7144
13	4.6672	3.8056	3.4105	3.1791	3.0254	2.9153	2.8321	2.7669	2.7144	13	4.6001	3.7389	3.3439	3.1122	2.9582	2.8477	2.7642	2.6987	2.6458
14	4.6001	3.7389	3.3439	3.1122	2.9582	2.8477	2.7642	2.6987	2.6458	14	4.5431	3.6823	3.2874	3.0556	2.9013	2.7905	2.7066	2.6408	2.5876
15	4.5431	3.6823	3.2874	3.0556	2.9013	2.7905	2.7066	2.6408	2.5876	15	4.4940	3.6337	3.2389	3.0069	2.8524	2.7413	2.6572	2.5911	2.5377
16	4.4940	3.6337	3.2389	3.0069	2.8524	2.7413	2.6572	2.5911	2.5377	16	4.4513	3.5915	3.1968	2.9647	2.8100	2.6987	2.6143	2.5480	2.4943
17	4.4513	3.5915	3.1968	2.9647	2.8100	2.6987	2.6143	2.5480	2.4943	17	4.4139	3.5546	3.1599	2.9277	2.7729	2.6613	2.5767	2.5102	2.4563
18	4.4139	3.5546	3.1599	2.9277	2.7729	2.6613	2.5767	2.5102	2.4563	18	4.3807	3.5219	3.1274	2.8951	2.7401	2.6283	2.5435	2.4768	2.4227
19	4.3807	3.5219	3.1274	2.8951	2.7401	2.6283	2.5435	2.4768	2.4227	19	4.3512	3.4928	3.0984	2.8661	2.7109	2.5990	2.5140	2.4471	2.3928
20	4.3512	3.4928	3.0984	2.8661	2.7109	2.5990	2.5140	2.4471	2.3928	20	4.3248	3.4668	3.0725	2.8401	2.6848	2.5727	2.4876	2.4205	2.3660
21	4.3248	3.4668	3.0725	2.8401	2.6848	2.5727	2.4876	2.4205	2.3660	21	4.3009	3.4434	3.0491	2.8167	2.6613	2.5491	2.4638	2.3965	2.3419
22	4.3009	3.4434	3.0491	2.8167	2.6613	2.5491	2.4638	2.3965	2.3419	22	4.2793	3.4221	3.0280	2.7955	2.6400	2.5277	2.4422	2.3748	2.3201
23	4.2793	3.4221	3.0280	2.7955	2.6400	2.5277	2.4422	2.3748	2.3201	23	4.2597	3.4028	3.0088	2.7763	2.6207	2.5082	2.4226	2.3551	2.3002
24	4.2597	3.4028	3.0088	2.7763	2.6207	2.5082	2.4226	2.3551	2.3002	24	4.2417	3.3852	2.9912	2.7587	2.6030	2.4904	2.4047	2.3371	2.2821
25	4.2417	3.3852	2.9912	2.7587	2.6030	2.4904	2.4047	2.3371	2.2821	25	4.2252	3.3690	2.9752	2.7426	2.5868	2.4741	2.3883	2.3205	2.2655
26	4.2252	3.3690	2.9752	2.7426	2.5868	2.4741	2.3883	2.3205	2.2655	26	4.2100	3.3541	2.9604	2.7278	2.5719	2.4591	2.3732	2.3053	2.2501
27	4.2100	3.3541	2.9604	2.7278	2.5719	2.4591	2.3732	2.3053	2.2501	27	4.1960	3.3404	2.9467	2.7141	2.5583	2.4453	2.3593	2.2913	2.2360
28	4.1960	3.3404	2.9467	2.7141	2.5583	2.4453	2.3593	2.2913	2.2360	28	4.1830	3.3277	2.9340	2.7014	2.5454	2.4324	2.3463	2.2783	2.2229
29	4.1830	3.3277	2.9340	2.7014	2.5454	2.4324	2.3463	2.2783	2.2229	29	4.1709	3.3158	2.9223	2.6896	2.5336	2.4205	2.3343	2.2662	2.2107
30	4.1709	3.3158	2.9223	2.6896	2.5336	2.4205	2.3343	2.2662	2.2107	30	4.1597	3.3044	2.9109	2.6781	2.5220	2.4089	2.3226	2.2545	2.1990
35	4.1213	3.2674	2.8742	2.6415	2.4851	2.3718	2.2852	2.2167	2.1608	35	4.1213	3.2674	2.8742	2.6415	2.4851	2.3718	2.2852	2.2167	2.1608
40	4.0847	3.2317	2.8387	2.6060	2.4495	2.3359	2.2490	2.1802	2.1240	40	4.0847	3.2317	2.8387	2.6060	2.4495	2.3359	2.2490	2.1802	2.1240
45	4.0566	3.2043	2.8115	2.5787	2.4221	2.3083	2.2212	2.1521	2.0958	45	4.0566	3.2043	2.8115	2.5787	2.4221	2.3083	2.2212	2.1521	2.0958
50	4.0343	3.1826	2.7900	2.5572	2.4003	2.2864	2.1992	2.1299	2.0734	50	4.0343	3.1826	2.7900	2.5572	2.4003	2.2864	2.1992	2.1299	2.0734
60	4.0012	3.1504	2.7581	2.5252	2.3683	2.2541	2.1665	2.0970	2.0401	60	4.0012	3.1504	2.7581	2.5252	2.3683	2.2541	2.1665	2.0970	2.0401
70	3.9778	3.1277	2.7355	2.5027	2.3456	2.2312	2.1435	2.0737	2.0166	70	3.9778	3.1277	2.7355	2.5027	2.3456	2.2312	2.1435	2.0737	2.0166
80	3.9604	3.1108	2.7188	2.4859	2.3287	2.2142	2.1263	2.0564	1.9991	80	3.9604	3.1108	2.7188	2.4859	2.3287	2.2142	2.1263	2.0564	1.9991
90	3.9469	3.0977	2.7058	2.4729	2.3157	2.2011	2.1131	2.0430	1.9856	90	3.9469	3.0977	2.7058	2.4729	2.3157	2.2011	2.1131	2.0430	1.9856
100	3.9361	3.0873	2.6955	2.4626	2.3053	2.1906	2.1025	2.0323	1.9748	100	3.9361	3.0873	2.6955	2.4626	2.3053	2.1906	2.1025	2.0323	1.9748
120	3.9201	3.0718	2.6802	2.4472	2.2899	2.1750	2.0868	2.0164	1.9588	120	3.9201	3.0718	2.6802	2.4472	2.2899	2.1750	2.0868	2.0164	1.9588