一、選擇題(單選題)，每題 2.5 分　※ 本大題請於試卷內之「選擇題作答區」依序作答。

1. The scores of individual students on the American College Testing (ACT) Program composite college entrance examination have a normal distribution with mean 18.6 and standard deviation 6.0. At Northside High, 36 seniors take the test. If the scores at this school have the same distribution as national scores, what is the mean of the sampling distribution of the average (sample mean) score for the 36 students?
   a. 1.0
   b. 3.1
   c. 6.0
   d. 18.6

2. I take a random sample survey of size n from a population that has mean 80 and standard deviation20. How big should n be so that the sampling distribution of $\bar{X}$ has standard deviation 1?
   a. 400
   b. 20
   c. Approximately 5
   d. Cannot be determined unless we know the population follows a normal distribution.

3. A researcher is interested in the size of the current balance of credit card holders. To estimate this, he obtains the size of the current balance of a random sample of 25 credit card holders. A 90% confidence interval for the mean current balance of credit card holders is found to be \$662.72± \$44.70. Which of the following would produce a confidence interval with a smaller margin of error than this 90% confidence interval?
   a. Obtain the balances of only five credit card holders rather than 25, because five are likely to be more uniform than 25.
   b. Obtain the balances of 100 credit card holders rather than 25.
   c. Computer a 99% confidence interval rather than a 90% confidence interval. The increase in confidence indicates that we have a better interval.
   d. None of the above.

4. In a large city, the percent of total spending that households devote to housing is normally distributed, with mean μ and standard deviation σ= 9%. I select a simple random sample of four young households and determine the percent of their total spending that is devoted to housing. The four percentages are

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33% 39% 32% 36%

Based on these data, a 99% confidence interval for μ is

a. 35% ±5.78%.
b. 35% ±8.82%
c. 35% ±11.59%
d. 35% ±23.18%

5. An engineer designs an improved light bulb. The previous design had an average lifetime of 1200 hours. The new bulb has a lifetime of 1201 hours, using a sample of 2000 bulbs. Although the difference is quite small, the effect is statistically significant. The explanation is
   a. that new designs typically have more variability than standard designs.
   b. that the sample size is very large.
   c. that the mean of 1200 is large.
   d. all of the above.

Use the following to answer questions 6-8

A marketing researcher was studying the effect of a supermarket display on sales of a new product. There were two designs for the display: the first had greater visual appeal, and the second contained more factual information about the product. each type of display could be made in three sizes, small, medium, or large. Eighteen supermarkets were available for the study, and three supermarkets were selected at random for each combination of display design and size. The number of unites of the product sold over a tow week period was recorded for each supermarket. For the resulting data, a two-way ANOVA was run with the partial ANOVA table given below.

Analysis of variance for SALES

Source	DF	SS	MS	F	P
Design					0.613
Size				7256	
Size*Design		41702			
Error			12262		
Total	17	20664			

6. The sum of squares for error is
   a. 1021.8
   b. 14512.0
   c. 20853.5
   d. 147144.0

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7. In the ANOVA table, the test for the main effect of DESIGN has a *P*-value of .613. This indicates that
   a. sales probably vary considerably for the different designs.
   b. for about 61.3% of the samples, there was a difference in the effect of design.
   c. for about 61.3% of the samples, there was no difference in the effect of design.
   d. None of the above is true.

8. the numerical value of the *F* statistic for testing interaction is
   a. 0.59
   b. 1.70
   c. 3.40
   d. 202.33

9. Investing is a game for chance. Suppose there is a 40% chance that a risky stock investment will end up in a total loss of your investment. Because the rewards are so high, you decide to invest in four independent risky stocks. Find the probability that at least one of your investments becomes a total loss.
   a. .0256
   b. .40
   c. .9744
   d. .8704

10. The on-line access computer service industry is growing at an extraordinary rate. Current estimates suggest that only 20% of the home-based computers have access to on-line services. This number is expected to grow quickly over the next five years. Suppose 25 people with home-based computers were randomly and independently sampled. Find the probability that fewer than half of those sampled currently have access to on-line service.
    a. 1.000
    b. .998
    c. 994
    d. .999

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11. A small company conducted a survey of its employees to determine their attitudes towards a buyout of the company's stock. The company's 1,040 employees were asked whether they favored a buyout and when they were planning to retire. The data is shown in the accompanying table:

		Plan to Retire In:			
		Less Than 5 Years	Between 5 and 15 Years	More than 15 Years	Total
Favor Buyout?	Yes	140	75	179	394
	No	60	122	464	646
Total		200	197	643	1,040

Consider the two events: A = plan to retire within 5 years
B = favor the buyout
Which of the following is true between events *A* and *B*?
a. *A* and *B* are independent of one another.
b. *A* and *B* are mutually exclusive events.
c. *A* and *B* are complimentary events.
d. *A* and *B* are dependent events.

12. A beer dispensing machine fills thousands of 12 ounce beers each day. The machine is very consistent but the pours do vary a little bit. Assume it is known that the distributions of pours is normally distributed with a mean of 12.1 ounces and a standard deviation of .05 ounces. Customers get very angry when their beers have less than the advertised 12 ounces of beer in them. Find the proportion of the customers that could get angry because of this reason.
a. .4772
b. .9772
c. .0.228
d. .5228

13. Recent market research reveals that an estimated 30% of U.S. households own one or more personal computers (PCs). Suppose that in a sample of 500 households in a large high-tech community, 178 own PCs. What distribution is appropriate to use to estimate the binomial random variable x = the number of the 500 homes that own PC's?
a. normal
b. exponential
c. Poisson
d. uniform

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14. we never conclude "Accept H0" in a test of hypothesis. This is because:
    a. α is the probability of a Type I error.
    b. The rejection region is not known.
    c. The p-value is not small enough.
    d. $\beta = p$ (type II error) is not known.

15. The manufacturer of an over-the-counter pain reliever claims that its product brings pain relief to headache sufferers in less than 3.5 minutes, on average. To be able to make this claim in its television advertisements, the manufacturer was required to present statistical evidence in support of their claim. The manufacturer reported that for a random sample of 50 headache sufferers, the mean time to relief was 3.3 minutes and the standard deviation was 60 seconds. Find the rejection region for the test if testing at $\alpha = .05$.
    a. Reject H_0 if $z < -1.96$.
    b. Reject H_0 if $z < -1.645$.
    c. Reject H_0 if $z < -1.282$.
    d. Reject H_0 if $z < -1.96$ or $z > 1.96$.

16. Researchers have claimed that the average number of headaches during a semester of Statistics is 14. Statistics professors dispute that this claim vehemently. Statistic professors believe the average is much more than this. They sample $n = 13$ students and find the sample mean is 16 and the sample standard deviation is 2.0. The test statistic for this test is:
    a. $t = 3.6$
    b. $t = 1.0$
    c. $t = 1.8$
    d. $t = 2.1$

17. A study was commissioned to compare the housing costs of two growing cities. The goal of the study was to estimate the difference in the average housing costs (as measured in price per square foot) of the two cities. Two pilot samples were taken and yielded the following information:

	City 1	City 2
Mean of housing cost	$50.40 per square foot	$53.70 per square foot
Std. dev. of housing cost	$4.50 per square foot	$5.30 per square foot

Use this information to determine how large the sample sizes must be in order to estimate the true difference in the average housing costs of the two cities to within $1.25. Assume that equal sample sizes are desired and a 95% reliability level is essential.

a. $n1 = n2 = 76$
b. $n1 = n2 = 84$
c. $n1 = n2 = 119$
d. $n1 = n2 = 25$

Use the following to answer questions 18-20

A computer used by a 24-hour banking service is supposed to randomly assign each transaction to one of five memory locations. A check at the end of a day's transactions gave the counts shown in the table to each of the five memory locations.

Memory Location	Number of Transactions
1	82
2	100
3	74
4	92
5	102

18. State the null hypothesis necessary to test whether the proportion of trnsactions assigned to the each of the five memory locations differ.

a. $\mu_1 = \mu_2 = \mu_3 = 1/5$
b. $p_1 = p_2 = p_3 = 1/5$
c. $p_1 = p_2 = p_3 = .90$
d. $\mu_1 = \mu_2 = \mu_3 = 90$

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19. Calculate the test statistic necessary to test whether the proportion of transactions assigned to each of the five memory locations differ.
    a. $x^2 = 6.31$
    b. $x^2 = 142$
    c. $x^2 = 7.25$
    d. $x^2 = 5.00$

20. Find the rejection region necessary for testing whether the proportion of transactions assigned to each of the five memory locations differ. Use $\alpha = .05$.
    a. Reject H_0 if $x^2 > 1.145476$
    b. Reject H_0 if $x^2 > 0.710721$
    c. Reject H_0 if $x^2 > 11.0705$
    d. Reject H_0 if $x^2 > 9.48773$

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二、 ※注意：請於試卷內之「非選擇題作答區」作答，並應註明作答之題號。

Question 1

The following equation has been estimated by OLS:

$$\ln \frac{Q}{L} = 1.551 + 0.654 \ln W - 0.0286 \ln Q \quad R^2 = 0.50$$

0.504)　(0.266)　　(0.0403)　　(1)

Where Q = output, L = labor, W = wage and the figures in parentheses are standard errors. It was derived from the marginal productivity condition for labor from the CES production function

$$Q = A\,[\alpha\, L^{-p} + (1-\alpha)\, K^{-p}\,]^{-v/p} \qquad (2)$$

where K = capital stock, on the assumption that labor is paid its marginal product. From (1) obtain:

(a) estimates of σ, where $\sigma = 1/(1+p)$, the elasticity of substitution between labor and capital. (10 points)

(b) estimates of v, the degree of returns to scale. (10 $points$)

Question2

Three hypotheses have been advanced to explain price formation:

A. The theory of marginal cost pricing which asserts that changes in prices (Δp) are due to changes in unit labor costs (ΔULC), changes in unit material costs (ΔUMC), changes in the ratio of unfilled orders to sales (Δ(O/S)) and the level of capacity utilization (CU).

B. The theory of target return pricing in which price changes are due to changes in standard or normal unit labor costs (ΔULC^N), changes in standard unit material costs (ΔUMC^N), changes in the standard capital- output ratio (Δ(K/Q)) and changes in target rates of return (Δπ).

C. The theory of full cost pricing which explains price changes by ΔULC^N and ΔUMC^N only.

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The following equations were estimated by OLS for manufacturing industries in a country during 1980s:

$$\Delta p = \text{const} + \underset{(1.69)}{0.068}\,\Delta ULC + \underset{(3.00)}{0.072}\,\Delta UMC + \underset{(5.72)}{0.0005}\,CU + \underset{(2.00)}{0.127}\,\Delta((Q/S)_{-1})$$

$$R^2 = 0.583$$

$$\Delta p = \text{const} + \underset{(2.70)}{0.235}\,\Delta ULC^N + \underset{(2.11)}{0.085}\,\Delta(ULC - ULC^N) + \underset{(2.52)}{0.155}\,\Delta ULC^N_{-1} +$$
$$\underset{(2.98)}{0.065}\,\Delta UMC + \underset{(3.08)}{0.0003}\,CU + \underset{(2.21)}{0.141}\,\Delta(O/S)_{-1}$$

$$R^2 = 0.654$$

The figures in parentheses are t statistics.

(a) Discuss briefly the economic reasoning behind these specifications of the three theories. (15 points)

(b) Evaluate the three hypotheses. (15 points)

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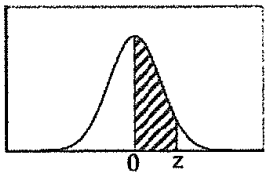
附表 1
標準常態分配機率表



z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.00000	0.00399	0.00798	0.01197	0.01595	0.01994	0.02392	0.02790	0.03188	0.03586
0.1	0.03983	0.04380	0.04776	0.05172	0.05567	0.05962	0.06356	0.06749	0.07142	0.07535
0.2	0.07926	0.08317	0.08706	0.09095	0.09483	0.09871	0.10257	0.10642	0.11026	0.11409
0.3	0.11791	0.12172	0.12552	0.12930	0.13307	0.13683	0.14058	0.14431	0.14803	0.15173
0.4	0.15542	0.15910	0.16276	0.16640	0.17003	0.17364	0.17724	0.18082	0.18439	0.18793
0.5	0.19146	0.19497	0.19847	0.20194	0.20540	0.20884	0.21226	0.21566	0.21904	0.22240
0.6	0.22575	0.22907	0.23237	0.23565	0.23891	0.24215	0.24537	0.24857	0.25175	0.25490
0.7	0.25804	0.26115	0.26424	0.26730	0.27035	0.27337	0.27637	0.27935	0.28230	0.28524
0.8	0.28814	0.29103	0.29389	0.29673	0.29955	0.30234	0.30511	0.30785	0.31057	0.31327
0.9	0.31594	0.31859	0.32121	0.32381	0.32639	0.32894	0.33147	0.33398	0.33646	0.33891
1.0	0.34134	0.34375	0.34614	0.34849	0.35083	0.35314	0.35543	0.35769	0.35993	0.36214
1.1	0.36433	0.36650	0.36864	0.37076	0.37286	0.37493	0.37698	0.37900	0.38100	0.38298
1.2	0.38493	0.38686	0.38877	0.39065	0.39251	0.39435	0.39617	0.39796	0.39973	0.40147
1.3	0.40320	0.40490	0.40658	0.40824	0.40988	0.41149	0.41309	0.41466	0.41621	0.41774
1.4	0.41924	0.42073	0.42220	0.42364	0.42507	0.42647	0.42785	0.42922	0.43056	0.43189
1.5	0.43319	0.43448	0.43574	0.43699	0.43822	0.43943	0.44062	0.44179	0.44295	0.44408
1.6	0.44520	0.44630	0.44738	0.44845	0.44950	0.45053	0.45154	0.45254	0.45352	0.45449
1.7	0.45543	0.45637	0.45728	0.45818	0.45907	0.45994	0.46080	0.46164	0.46246	0.46327
1.8	0.46407	0.46485	0.46562	0.46638	0.46712	0.46784	0.46856	0.46926	0.46995	0.47062
1.9	0.47128	0.47193	0.47257	0.47320	0.47381	0.47441	0.47500	0.47558	0.47615	0.47670
2.0	0.47725	0.47778	0.47831	0.47882	0.47932	0.47982	0.48030	0.48077	0.48124	0.48169
2.1	0.48214	0.48257	0.48300	0.48341	0.48382	0.48422	0.48461	0.48500	0.48537	0.48574
2.2	0.48610	0.48645	0.48679	0.48713	0.48745	0.48778	0.48809	0.48840	0.48870	0.48899
2.3	0.48928	0.48956	0.48983	0.49010	0.49036	0.49061	0.49086	0.49111	0.49134	0.49158
2.4	0.49180	0.49202	0.49224	0.49245	0.49266	0.49286	0.49305	0.49324	0.49343	0.49361
2.5	0.49379	0.49396	0.49413	0.49430	0.49446	0.49461	0.49477	0.49492	0.49506	0.49520
2.6	0.49534	0.49547	0.49560	0.49573	0.49585	0.49598	0.49609	0.49621	0.49632	0.49643
2.7	0.49653	0.49664	0.49674	0.49683	0.49693	0.49702	0.49711	0.49720	0.49728	0.49736
2.8	0.49744	0.49752	0.49760	0.49767	0.49774	0.49781	0.49788	0.49795	0.49801	0.49807
2.9	0.49813	0.49819	0.49825	0.49831	0.49836	0.49841	0.49846	0.49851	0.49856	0.49861
3.0	0.49865	0.49869	0.49874	0.49878	0.49882	0.49886	0.49889	0.49893	0.49896	0.49900

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附表 2　t 分配機率表

表中數值滿足 $P(t \geq t_{v,\alpha})$。例如，自由度 v=10 且右尾面積為 0.05，所對應的 $t_{10,0.05}$ 是 1.8125

v	0.20	0.10	0.05	0.025	0.01	0.005	0.0025	0.001
1	1.3764	3.0777	6.3138	12.706	31.821	63.657	127.32	318.31
2	1.0607	1.8856	2.9200	4.3027	6.9646	9.9248	14.089	22.327
3	0.9785	1.6377	2.3534	3.1824	4.5407	5.8409	7.4533	10.215
4	0.9410	1.5332	2.1318	2.7764	3.7469	4.6041	5.5976	7.1732
5	0.9195	1.4759	2.0150	2.5706	3.3649	4.0321	4.7733	5.8934
6	0.9057	1.4398	1.9432	2.4469	3.1427	3.7074	4.3168	5.2076
7	0.8960	1.4149	1.8946	2.3646	2.9980	3.4995	4.0293	4.7853
8	0.8889	1.3968	1.8595	2.3060	2.8965	3.3554	3.8325	4.5008
9	0.8834	1.3830	1.8331	2.2622	2.8214	3.2498	3.6897	4.2968
10	0.8791	1.3722	1.8125	2.2281	2.7638	3.1693	3.5814	4.1437
11	0.8755	1.3634	1.7959	2.2010	2.7181	3.1058	3.4966	4.0247
12	0.8726	1.3562	1.7823	2.1788	2.6810	3.0545	3.4284	3.9296
13	0.8702	1.3502	1.7709	2.1604	2.6503	3.0123	3.3725	3.8520
14	0.8681	1.3450	1.7613	2.1448	2.6245	2.9768	3.3257	3.7874
15	0.8662	1.3406	1.7531	2.1314	2.6025	2.9467	3.2860	3.7328
16	0.8647	1.3368	1.7459	2.1199	2.5835	2.9208	3.2520	3.6862
17	0.8633	1.3334	1.7396	2.1098	2.5669	2.8982	3.2224	3.6458
18	0.8620	1.3304	1.7341	2.1009	2.5524	2.8784	3.1966	3.6105
19	0.8610	1.3277	1.7291	2.0930	2.5395	2.8609	3.1737	3.5794
20	0.8600	1.3253	1.7247	2.0860	2.5280	2.8453	3.1534	3.5518
21	0.8591	1.3232	1.7207	2.0796	2.5176	2.8314	3.1352	3.5272
22	0.8583	1.3212	1.7171	2.0739	2.5083	2.8188	3.1188	3.5050
23	0.8575	1.3195	1.7139	2.0687	2.4999	2.8073	3.1040	3.4850
24	0.8569	1.3178	1.7109	2.0639	2.4922	2.7969	3.0905	3.4668
25	0.8562	1.3163	1.7081	2.0595	2.4851	2.7874	3.0782	3.4502
26	0.8557	1.3150	1.7056	2.0555	2.4786	2.7787	3.0669	3.4350
27	0.8551	1.3137	1.7033	2.0518	2.4727	2.7707	3.0565	3.4210
28	0.8546	1.3125	1.7011	2.0484	2.4671	2.7633	3.0469	3.4082
29	0.8542	1.3114	1.6991	2.0452	2.4620	2.7564	3.0380	3.3962
30	0.8538	1.3104	1.6973	2.0423	2.4573	2.7500	3.0298	3.3852
40	0.8507	1.3031	1.6839	2.0211	2.4233	2.7045	2.9712	3.3069
50	0.8489	1.2987	1.6759	2.0086	2.4033	2.6778	2.9370	3.2614
60	0.8477	1.2958	1.6706	2.0003	2.3901	2.6603	2.9146	3.2317
80	0.8461	1.2922	1.6641	1.9901	2.3739	2.6387	2.8870	3.1953
120	0.8446	1.2886	1.6577	1.9799	2.3578	2.6174	2.8599	3.1595

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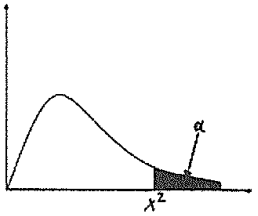
附表 3 卡方分配表

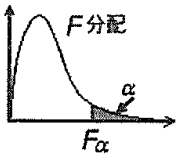


自由度	$\chi^2_{0.995}$	$\chi^2_{0.99}$	$\chi^2_{0.975}$	$\chi^2_{0.95}$	$\chi^2_{0.9}$	$\chi^2_{0.1}$	$\chi^2_{0.05}$	$\chi^2_{0.025}$	$\chi^2_{0.01}$	$\chi^2_{0.005}$
1	0.00	0.00	0.00	0.00	0.02	2.71	3.84	5.02	6.63	7.88
2	0.01	0.02	0.05	0.10	0.21	4.61	5.99	7.38	9.21	10.60
3	0.07	0.11	0.22	0.35	0.58	6.25	7.81	9.35	11.34	12.84
4	0.21	0.30	0.48	0.71	1.06	7.78	9.49	11.14	13.28	14.86
5	0.41	0.55	0.83	1.15	1.61	9.24	11.07	12.83	15.09	16.75
6	0.68	0.87	1.24	1.64	2.20	10.64	12.59	14.45	16.81	18.55
7	0.99	1.24	1.69	2.17	2.83	12.02	14.07	16.01	18.48	20.28
8	1.34	1.65	2.18	2.73	3.49	13.36	15.51	17.53	20.09	21.95
9	1.73	2.09	2.70	3.33	4.17	14.68	16.92	19.02	21.67	23.59
10	2.16	2.56	3.25	3.94	4.87	15.99	18.31	20.48	23.21	25.19
11	2.60	3.05	3.82	4.57	5.58	17.28	19.68	21.92	24.72	26.76
12	3.07	3.57	4.40	5.23	6.30	18.55	21.03	23.34	26.22	28.30
13	3.57	4.11	5.01	5.89	7.04	19.81	22.36	24.74	27.69	29.82
14	4.07	4.66	5.63	6.57	7.79	21.06	23.68	26.12	29.14	31.32
15	4.60	5.23	6.26	7.26	8.55	22.31	25.00	27.49	30.58	32.80
16	5.14	5.81	6.91	7.96	9.31	23.54	26.30	28.85	32.00	34.27
17	5.70	6.41	7.56	8.67	10.09	24.77	27.59	30.19	33.41	35.72
18	6.26	7.01	8.23	9.39	10.86	25.99	28.87	31.53	34.81	37.16
19	6.84	7.63	8.91	10.12	11.65	27.20	30.14	32.85	36.19	38.58
20	7.43	8.26	9.59	10.85	12.44	28.41	31.41	34.17	37.57	40.00
21	8.03	8.90	10.28	11.59	13.24	29.62	32.67	35.48	38.93	41.40
22	8.64	9.54	10.98	12.34	14.04	30.81	33.92	36.78	40.29	42.80
23	9.26	10.20	11.69	13.09	14.85	32.01	35.17	38.08	41.64	44.18
24	9.89	10.86	12.40	13.85	15.66	33.20	36.42	39.36	42.98	45.56
25	10.52	11.52	13.12	14.61	16.47	34.38	37.65	40.65	44.31	46.93
26	11.16	12.20	13.84	15.38	17.29	35.56	38.89	41.92	45.64	48.29
27	11.81	12.88	14.57	16.15	18.11	36.74	40.11	43.19	46.96	49.64
28	12.46	13.56	15.31	16.93	18.94	37.92	41.34	44.46	48.28	50.99
29	13.12	14.26	16.05	17.71	19.77	39.09	42.56	45.72	49.59	52.34
30	13.79	14.95	16.79	18.49	20.60	40.26	43.77	46.98	50.89	53.67

接次頁

附表 4 F 分配表

$F_{0.05,df_1,df_2}$ 值



$\alpha = 0.05$

df_2 \ df_1	1	2	3	4	5	6	7	8	9	10	11	12
1	161.4	199	216	225	230	234	236.8	239	241	242	243	244
2	18.51	19	19.2	19.2	19.3	19.3	19.35	19.4	19.4	19.4	19.4	19.4
3	10.13	9.55	9.28	9.12	9.01	8.94	8.887	8.85	8.81	8.79	8.76	8.74
4	7.709	6.94	6.59	6.39	6.26	6.16	6.094	6.04	6	5.96	5.94	5.91
5	6.608	5.79	5.41	5.19	5.05	4.95	4.876	4.82	4.77	4.74	4.7	4.68
6	5.987	5.14	4.76	4.53	4.39	4.28	4.207	4.15	4.1	4.06	4.03	4
7	5.591	4.74	4.35	4.12	3.97	3.87	3.787	3.73	3.68	3.64	3.6	3.57
8	5.318	4.46	4.07	3.84	3.69	3.58	3.5	3.44	3.39	3.35	3.31	3.28
9	5.117	4.26	3.86	3.63	3.48	3.37	3.293	3.23	3.18	3.14	3.1	3.07
10	4.965	4.1	3.71	3.48	3.33	3.22	3.135	3.07	3.02	2.98	2.94	2.91
11	4.844	3.98	3.59	3.36	3.2	3.09	3.012	2.95	2.9	2.85	2.82	2.79
12	4.747	3.89	3.49	3.26	3.11	3	2.913	2.85	2.8	2.75	2.72	2.69
13	4.667	3.81	3.41	3.18	3.03	2.92	2.832	2.77	2.71	2.67	2.63	2.6
14	4.6	3.74	3.34	3.11	2.96	2.85	2.764	2.7	2.65	2.6	2.57	2.53
15	4.543	3.68	3.29	3.06	2.9	2.79	2.707	2.64	2.59	2.54	2.51	2.48
16	4.494	3.63	3.24	3.01	2.85	2.74	2.657	2.59	2.54	2.49	2.46	2.42
17	4.451	3.59	3.2	2.96	2.81	2.7	2.614	2.55	2.49	2.45	2.41	2.38
18	4.414	3.55	3.16	2.93	2.77	2.66	2.577	2.51	2.46	2.41	2.37	2.34
19	4.381	3.52	3.13	2.9	2.74	2.63	2.544	2.48	2.42	2.38	2.34	2.31
20	4.351	3.49	3.1	2.87	2.71	2.6	2.514	2.45	2.39	2.35	2.31	2.28
21	4.325	3.47	3.07	2.84	2.68	2.57	2.488	2.42	2.37	2.32	2.28	2.25
22	4.301	3.44	3.05	2.82	2.66	2.55	2.464	2.4	2.34	2.3	2.26	2.23
23	4.279	3.42	3.03	2.8	2.64	2.53	2.442	2.37	2.32	2.27	2.24	2.2
24	4.26	3.4	3.01	2.78	2.62	2.51	2.423	2.36	2.3	2.25	2.22	2.18

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