

說明：共八題，前面4題每題10分，後面4題每題15分，合計100分

1. A公司想了解某一產品市場上之佔有率，A公司希望在95%信心水準與估計之誤差小於3%之下，請問A公司需訪問多少位消費者？
(a) 假定以往經驗得知佔有率為30%，需訪問多少位消費者？(5%)
(b) 假定佔有率未知時，需訪問多少位消費者？(5%)
2. 某公司去年銷售狀況為平均每月8萬瓶，中位數每月6萬瓶，衆數每月5萬5千瓶。試根據以上數據說明該公司之銷售概況。(10%)
3. 實力相等之A、B、C三位棋士，最初由A、B開始比賽，輸者退出由剩餘者補入，連勝二次者為獲勝，問三位之勝率各是多少？(10%)
4. 設 X_1, X_2 為獨立的服從標準常態分配 $N(0, 1)$ ，其與 ρ, θ 間之關係為 $X_1 = \rho \cos \theta, X_2 = \rho \sin \theta$
試證 ρ^2 之分配為自由度2之卡方(chi-square)分配。(10%)
5. 樣本平均數之抽樣分配服從常態分配 $N(\mu, \frac{\sigma^2}{n})$ ，當 σ^2 已知時試推導 μ 之 $(1-\alpha)100\%$ 信賴區間為 $\bar{x} \pm z_{\alpha/2} \frac{\sigma}{\sqrt{n}}$ ，其中 z 為標準常態分配 $N(0, 1)$ 。(15%)
(提示：利用 z 介於 $-z_{\alpha/2}$ 至 $z_{\alpha/2}$ 之機率為 $1-\alpha$)
6. 有一常態分配，將學生分數分成三部分，小於75分者占所有學生57.93%，在75分至80分之間者為38.06%，大於80分者為4.01%，試求該分配之 μ 及 σ ？(求其平均數、標準差)(15%)

(背面仍有題目，請繼續作答)

7. 2個常態母群體 $N(\mu_1, 1)$, $N(\mu_2, 3)$ 抽出 n_1, n_2 個獨立樣本, 試用 \bar{X}_1, \bar{X}_2 來求 $\mu_1 - \mu_2$ 在 95% 之信賴區間, 當 $n_1 + n_2 = 50$ 時 為使信賴區間最小之下, 則 n_1, n_2 之值為何? (15%)

8. 設由一米倉隨機抽出 10 袋米之重量為:

303.4 303.6 303.5 303.4 303.6 (斤)


303.5 303.6 303.4 303.6 303.2 (斤)

其麻袋之重量(只抽查六袋)為:

6.0 5.7 5.8 5.8 5.8 5.7 (斤)

試求 95% 信賴度下袋內米平均淨重量之信賴區間。(15%)

TABLE 1 Normal Curve Areas



z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.00	.0000	.0040	.0080	.0120	.0160	.0199	.0239	.0279	.0319	.0359
0.10	.0398	.0438	.0478	.0517	.0557	.0596	.0636	.0675	.0714	.0753
0.20	.0793	.0832	.0871	.0910	.0948	.0987	.1026	.1064	.1103	.1141
0.30	.1179	.1217	.1255	.1293	.1331	.1368	.1406	.1443	.1480	.1517
0.40	.1554	.1591	.1628	.1664	.1700	.1736	.1772	.1808	.1844	.1879
0.50	.1915	.1950	.1985	.2019	.2054	.2088	.2123	.2157	.2190	.2224
0.60	.2257	.2291	.2324	.2357	.2389	.2422	.2454	.2486	.2517	.2549
0.70	.2580	.2611	.2642	.2673	.2704	.2734	.2764	.2794	.2823	.2852
0.80	.2881	.2910	.2939	.2967	.2995	.3023	.3051	.3078	.3106	.3133
0.90	.3159	.3186	.3212	.3238	.3264	.3289	.3315	.3340	.3365	.3389
1.00	.3413	.3438	.3461	.3485	.3508	.3531	.3554	.3577	.3599	.3621
1.10	.3643	.3665	.3686	.3708	.3729	.3749	.3770	.3790	.3810	.3830
1.20	.3849	.3869	.3888	.3907	.3925	.3944	.3962	.3980	.3997	.4015
1.30	.4032	.4049	.4066	.4082	.4099	.4115	.4131	.4147	.4162	.4177
1.40	.4192	.4207	.4222	.4236	.4251	.4265	.4279	.4292	.4306	.4319
1.50	.4332	.4345	.4357	.4370	.4382	.4394	.4406	.4418	.4429	.4441
1.60	.4452	.4463	.4474	.4484	.4495	.4505	.4515	.4525	.4535	.4545
1.70	.4554	.4564	.4573	.4582	.4591	.4599	.4608	.4616	.4625	.4633
1.80	.4641	.4649	.4656	.4664	.4671	.4678	.4686	.4693	.4699	.4706
1.90	.4713	.4719	.4726	.4732	.4738	.4744	.4750	.4756	.4761	.4767
2.00	.4772	.4778	.4783	.4788	.4793	.4798	.4803	.4808	.4812	.4817
2.10	.4821	.4826	.4830	.4834	.4838	.4842	.4846	.4850	.4854	.4857
2.20	.4861	.4864	.4868	.4871	.4875	.4878	.4881	.4884	.4887	.4890
2.30	.4893	.4896	.4898	.4901	.4904	.4906	.4909	.4911	.4913	.4916
2.40	.4918	.4920	.4922	.4925	.4927	.4929	.4931	.4932	.4934	.4936
2.50	.4938	.4940	.4941	.4943	.4945	.4946	.4948	.4949	.4951	.4952
2.60	.4953	.4955	.4956	.4957	.4959	.4960	.4961	.4962	.4963	.4964
2.70	.4965	.4966	.4967	.4968	.4969	.4970	.4971	.4972	.4973	.4974
2.80	.4974	.4975	.4976	.4977	.4977	.4978	.4979	.4979	.4980	.4981
2.90	.4981	.4982	.4982	.4983	.4984	.4984	.4985	.4985	.4986	.4986
3.00	.4987	.4987	.4987	.4988	.4988	.4989	.4989	.4989	.4990	.4990

z	Area
3.50	.99976737
4.00	.99996833
4.50	.99999660
5.00	.99999971

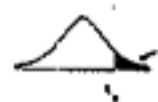


TABLE 2. Percentage Points of the *t* Distribution

df	$\alpha = .1$	$\alpha = .05$	$\alpha = .025$	$\alpha = .01$	$\alpha = .005$	$\alpha = .001$
1	3.078	6.314	12.706	31.821	63.657	318.309
2	1.886	2.920	4.303	6.965	9.925	22.327
3	1.638	2.353	3.182	4.541	5.841	10.215
4	1.533	2.132	2.776	3.747	4.604	7.173
5	1.476	2.015	2.571	3.365	4.032	5.893
6	1.440	1.943	2.447	3.143	3.707	5.208
7	1.415	1.895	2.365	2.998	3.499	4.785
8	1.397	1.860	2.306	2.896	3.355	4.501
9	1.383	1.833	2.262	2.821	3.250	4.297
10	1.372	1.812	2.228	2.764	3.169	4.144
11	1.363	1.796	2.201	2.718	3.106	4.025
12	1.356	1.782	2.179	2.681	3.055	3.930
13	1.350	1.771	2.160	2.650	3.012	3.852
14	1.345	1.761	2.145	2.624	2.977	3.787
15	1.341	1.753	2.131	2.602	2.947	3.733
16	1.337	1.746	2.120	2.583	2.921	3.686
17	1.333	1.740	2.110	2.567	2.898	3.646
18	1.330	1.734	2.101	2.552	2.878	3.610
19	1.328	1.729	2.093	2.539	2.861	3.579
20	1.325	1.725	2.086	2.528	2.845	3.552
21	1.323	1.721	2.080	2.518	2.831	3.527
22	1.321	1.717	2.074	2.508	2.819	3.505
23	1.319	1.714	2.069	2.500	2.807	3.485
24	1.318	1.711	2.064	2.492	2.797	3.467
25	1.316	1.708	2.060	2.485	2.787	3.450
26	1.315	1.706	2.056	2.479	2.779	3.435
27	1.314	1.703	2.052	2.473	2.771	3.421
28	1.313	1.701	2.048	2.467	2.763	3.408
29	1.311	1.699	2.045	2.462	2.756	3.396
30	1.310	1.697	2.042	2.457	2.750	3.385
40	1.303	1.684	2.021	2.423	2.704	3.307
60	1.296	1.671	2.000	2.390	2.660	3.232
120	1.289	1.658	1.980	2.358	2.617	3.160
240	1.285	1.651	1.970	2.342	2.596	3.125
inf.	1.282	1.645	1.960	2.326	2.576	3.090