

注意：請在答案卷上依序作答，計算題與假說檢定題必須列出算式及推論過程。

- 下列哪些觀察值屬於離散型資料 (discrete data)? (5%)
 - 某位新生兒的體重
 - 台北市去年調查飼養之家犬總數
 - 某晚宴後食物中毒的人數
 - 某牧場乳牛的泌乳量
- 描繪盒狀圖 (box plots) 時需要哪些統計數值? (5%)
- 某一群男性平均身高為 68 吋，標準差為 6 吋，試問：
 - 隨機從中抽取一名男性，其身高超過 80 吋的百分比為何? (5%)
 - 若每次以 $n = 25$ 對此群男性重複抽樣量取身高，所得到之樣本平均身高為 67.1 吋以下的百分比為何? (5%)
 - 承上題，抽樣所得身高最高的 10% 中，其身高應為幾吋以上? (5%)
- 為研究胰臟癌患者的收縮壓情形，抽樣 16 位胰臟癌患者測得其平均收縮壓為 135 mmHg，標準差為 20 mmHg：
 - 請建構胰臟癌患者平均收縮壓之 95% 信賴區間。(5%)
 - 以顯著水準 0.05 進行檢定，胰臟癌患者之平均收縮壓與正常人 (平均收縮壓為 120 mmHg) 相比是否有差異? (10%)
- 以 A 藥物投藥於 4 隻老鼠，測得其投藥前後膽固醇值如下，試問：

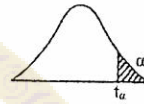
老鼠編號	1	2	3	4
投藥前	92	88	86	93
投藥後	84	85	79	87

 - 這些樣本是配對 (paired) 資料還是獨立 (independent) 資料? (5%)
 - 以顯著水準 0.05 進行檢定，投藥是否改變老鼠的膽固醇值? (15%)
 - 承上題，此檢定犯第一型誤差 (α error) 的機率為何? (5%)
- 調查 50 名胃癌病患其過去攝取辛辣食物的情形中，有 45 位患者愛吃辛辣食物，另外也調查了 450 名從未罹患胃癌的健康民眾中，則有 200 位愛吃辛辣食物。請以顯著水準 0.05 的卡方檢定，推論愛吃辛辣食物與罹患胃癌的關聯性。(15%)

7. 解釋名詞：

- [1] 第二型誤差 (β error) (5%)
- [2] 相關係數 (Correlation coefficient) (5%)
- [3] 判定係數 (Coefficient of determination) (5%)
- [4] 多重事後比較 (Multiple comparison procedures) (5%)

t 分配表



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	2.482	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

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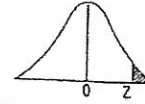
題號： 45

科目：生物統計學

題號： 45

共 3 頁之第 3 頁

標準常態分布表(二)



Z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.00	.5000	.4960	.4920	.4880	.4840	.4801	.4761	.4721	.4681	.4641
0.10	.4602	.4562	.4522	.4483	.4443	.4404	.4364	.4325	.4286	.4247
0.20	.4207	.4168	.4129	.4090	.4052	.4013	.3974	.3936	.3897	.3859
0.30	.3821	.3783	.3745	.3707	.3669	.3632	.3594	.3557	.3520	.3483
0.40	.3446	.3409	.3372	.3336	.3300	.3264	.3228	.3192	.3156	.3121
0.50	.3085	.3050	.3015	.2981	.2946	.2912	.2877	.2843	.2810	.2776
0.60	.2743	.2709	.2676	.2643	.2611	.2578	.2546	.2514	.2483	.2451
0.70	.2420	.2389	.2358	.2327	.2296	.2266	.2236	.2206	.2177	.2148
0.80	.2119	.2090	.2061	.2033	.2005	.1977	.1949	.1922	.1894	.1867
0.90	.1841	.1814	.1788	.1762	.1736	.1711	.1685	.1660	.1635	.1611
1.00	.1587	.1562	.1539	.1515	.1492	.1469	.1446	.1423	.1401	.1379
1.10	.1357	.1335	.1314	.1292	.1271	.1251	.1230	.1210	.1190	.1170
1.20	.1151	.1131	.1112	.1093	.1075	.1056	.1038	.1020	.1003	.0985
1.30	.0968	.0951	.0934	.0918	.0901	.0885	.0869	.0853	.0838	.0823
1.40	.0808	.0793	.0778	.0764	.0749	.0735	.0721	.0708	.0694	.0681
1.50	.0668	.0655	.0643	.0630	.0618	.0606	.0594	.0582	.0571	.0559
1.60	.0548	.0537	.0526	.0516	.0505	.0495	.0485	.0475	.0465	.0455
1.70	.0446	.0436	.0427	.0418	.0409	.0401	.0392	.0384	.0375	.0367
1.80	.0359	.0351	.0344	.0336	.0329	.0322	.0314	.0307	.0301	.0294
1.90	.0287	.0281	.0274	.0268	.0262	.0256	.0250	.0244	.0239	.0233
2.00	.0228	.0222	.0217	.0212	.0207	.0202	.0197	.0192	.0188	.0183
2.10	.0179	.0174	.0170	.0166	.0162	.0158	.0154	.0150	.0146	.0143
2.20	.0139	.0136	.0132	.0129	.0125	.0122	.0119	.0116	.0113	.0110
2.30	.0107	.0104	.0102	.0099	.0096	.0094	.0091	.0089	.0087	.0084
2.40	.0082	.0080	.0078	.0075	.0073	.0071	.0069	.0068	.0066	.0064
2.50	.0062	.0060	.0059	.0057	.0055	.0054	.0052	.0051	.0049	.0048
2.60	.0047	.0045	.0044	.0043	.0041	.0040	.0039	.0038	.0037	.0036
2.70	.0035	.0034	.0033	.0032	.0031	.0030	.0029	.0028	.0027	.0026
2.80	.0026	.0025	.0024	.0023	.0023	.0022	.0021	.0021	.0020	.0019
2.90	.0019	.0018	.0018	.0017	.0016	.0016	.0015	.0015	.0014	.0014
3.00	.0013	.0013	.0013	.0012	.0012	.0011	.0011	.0011	.0010	.0010

$\chi^2_{1,0.95}=3.84, \chi^2_{1,0.975}=5.02, \chi^2_{2,0.95}=5.99, \chi^2_{2,0.975}=7.38$

試題隨卷繳回