

請注意：未寫出計算式者不計分。請計算至小數點第二位，四捨五入。

一、以下是某一學校學生的隨機樣本之性別與年齡的交叉次數分配表。

年齡 \ 性別	性別		總數
	男性	女性	
18-20 歲	15	75	90
21-23 歲	15	75	90
24-26 歲	35	55	90
27-29 歲	35	55	90
總數	100	260	360

- (1) 請計算男性之平均年齡與變異數。(3 分)
- (2) 男性與女性之年齡的變異程度，何者較大？(7 分)
- (3) 若隨機從全部之 360 個學生中抽取一人，則此人為男生之機率？(3 分)
- (4) 若隨機從全部之 360 個學生中抽取一人，若已知此人之年齡為 20-21 歲，則此人為男生之機率？(7 分)
- (5) 請以 95% 的信賴區間，檢定此一學校男性與女性之年齡是否有顯著之差異
 - A. 請寫出虛無假設與對立假設 (5 分)
 - B. 請寫出男性與女性之年齡差異的 95% 信賴區間 (15 分)
 - C. 請說明你檢定之結果 (10 分)

系所組：國際企業管理學系碩士班一般生

日期節次：101 年 3 月 17 日第 3 節 13:00~14:30

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Part II:**Performing the following analyses with .05 level of significance**

15% (1) Suppose that a travel agent randomly sampled individuals in her target market to determine their travel habits. Table below gives the summary of the respondents regarding their last business or leisure trip:

Reservation method	Female	Male
Used a travel agent	80	100
Booked on the internet	120	240
Airline's toll-free number	50	10

Based on the data, can you conclude whether there is any association between the respondents' gender and the methods used by respondents to make airline reservation?

35% (2) To investigate which method used by the consumers to make airline reservation may consume less time for booking, 15 individuals are randomly divided into three groups and each group uses one of the assigned methods to make airline reservation. The times needed to complete the booking were recorded as follows:

Reservation method	Times (in minutes)	Total	Variance
Used a travel agent	20, 25, 22, 15, 30	112	31.3
Booked on the internet	35, 25, 30, 40, 20	150	62.5
Airline's toll-free number	50, 45, 40, 35, 40	210	32.5

15% (A) Is there evidence to conclude that the average times needed to complete the booking for the three reservation methods are different?

5% (B) Are there any required assumptions for the analysis in (A) to be valid?

15% (C) Can you conclude that there is a difference in the time needed to complete the booking between "Used a travel agent" and "Booked on the internet" ?

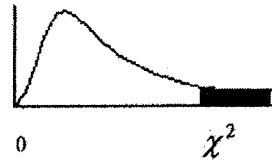
中國文化大學 101 學年度碩士班考試入學招生考試

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附表 卡方分配表



自由度	卡方分配底下之右尾面積									
	.995	.990	.975	.950	.900	.100	.050	.025	.010	.005
1	0.000	0.000	0.001	0.004	0.016	2.706	3.841	5.024	6.635	7.878
2	0.010	0.020	0.051	0.103	0.211	4.605	5.991	7.378	9.210	10.597
3	0.072	0.115	0.216	0.352	0.584	6.251	7.815	9.348	11.345	12.838
4	0.207	0.297	0.484	0.711	1.064	7.779	9.488	11.143	13.277	14.860
5	0.412	0.554	0.831	1.145	1.610	9.236	11.070	12.833	15.086	16.750
6	0.676	0.872	1.237	1.635	2.204	10.645	12.592	14.449	16.812	18.548
7	0.989	1.239	1.690	2.167	2.833	12.017	14.067	16.013	18.475	20.278
8	1.344	1.646	2.180	2.733	3.490	13.362	15.507	17.535	20.090	21.955
9	1.735	2.088	2.700	3.325	4.168	14.684	16.919	19.023	21.666	23.589
10	2.156	2.558	3.247	3.940	4.865	15.987	18.307	20.483	23.209	25.188
11	2.603	3.053	3.816	4.575	5.578	17.275	19.675	21.920	24.725	26.757
12	3.074	3.571	4.404	5.226	6.304	18.549	21.026	23.337	26.217	28.300
13	3.565	4.107	5.009	5.892	7.042	19.812	22.362	24.736	27.688	29.819
14	4.075	4.660	5.629	6.571	7.790	21.064	23.685	26.119	29.141	31.319
15	4.601	5.229	6.262	7.261	8.547	22.307	24.996	27.488	30.578	32.801
16	5.142	5.812	6.908	7.962	9.312	23.542	26.296	28.845	32.000	34.267
17	5.697	6.408	7.564	8.672	10.088	24.769	27.587	30.191	33.409	35.718
18	6.265	7.018	8.231	9.390	10.865	25.989	28.869	31.526	34.805	37.156
19	6.844	7.633	8.907	10.117	11.651	27.204	30.144	32.852	36.191	38.587
20	7.434	8.260	9.591	10.851	12.443	28.412	31.410	34.170	37.566	39.997
21	8.034	8.897	10.283	11.591	13.240	29.615	32.671	35.479	38.932	41.401
22	8.643	9.542	10.982	12.338	14.041	30.813	33.924	36.781	40.289	42.796
23	9.260	10.196	11.689	13.091	14.848	32.007	35.172	38.076	41.638	44.181
24	9.886	10.856	12.401	13.848	15.659	33.196	36.415	39.364	42.980	45.559
25	10.520	11.524	13.120	14.611	16.473	34.382	37.652	40.646	44.314	46.928
26	11.160	12.198	13.844	15.379	17.292	35.563	38.885	41.923	45.642	48.290
27	11.808	12.879	14.573	16.151	18.114	36.741	40.113	43.195	46.963	49.645
28	12.461	13.565	15.308	16.928	18.939	37.916	41.337	44.461	48.278	50.993
29	13.121	14.256	16.047	17.708	19.768	39.087	42.557	45.722	49.588	52.330
30	13.787	14.953	16.791	18.493	20.599	40.256	43.773	46.979	50.892	53.672
40	20.707	22.164	24.433	26.509	29.051	51.805	55.58	59.342	63.691	66.766
50	27.991	29.707	32.357	34.764	37.689	63.167	67.505	71.420	76.154	79.490
60	35.534	37.485	40.482	43.188	46.459	74.397	79.082	83.298	88.379	91.952
70	43.275	45.442	48.758	51.739	55.329	85.527	90.531	95.023	100.425	104.215
80	51.172	53.540	57.153	60.391	64.278	96.578	101.879	106.629	112.329	116.321
90	59.196	61.754	65.647	69.126	73.291	107.565	113.145	118.136	124.116	128.299
100	67.328	70.065	74.222	77.929	82.358	118.498	124.342	129.561	135.807	140.169

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本試題探
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TABLE Critical Values of F



Table of Critical Values of F for alpha = 0.05. Columns represent v1 = df, numerator (1 to infinity) and rows represent v2 = df, denominator (1 to infinity).

TABLE



Table of Critical Values of F for alpha = 0.025. Columns represent v1 = df, numerator (1 to infinity) and rows represent v2 = df, denominator (1 to infinity).

本試題採
雙面印刷

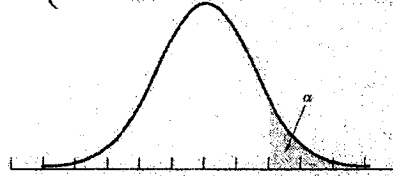
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TABLE 4 Critical Values (t distribution)



Degrees of Freedom	Upper Tail Probability (α)								
	0.15	0.10	0.05	0.025	0.015	0.01	0.005	0.001	0.0005
1	1.963	3.078	6.314	12.706	21.205	31.821	63.657	318.309	1273.155
2	1.386	1.886	2.920	4.303	5.643	6.965	9.925	22.327	44.703
3	1.250	1.638	2.353	3.182	3.896	4.541	5.841	10.215	16.326
4	1.190	1.533	2.132	2.776	3.298	3.747	4.604	7.173	10.305
5	1.156	1.476	2.015	2.571	3.003	3.365	4.032	5.893	7.976
6	1.134	1.440	1.943	2.447	2.829	3.143	3.707	5.208	6.788
7	1.119	1.415	1.895	2.365	2.715	2.998	3.499	4.785	6.082
8	1.108	1.397	1.860	2.306	2.634	2.896	3.355	4.501	5.617
9	1.100	1.383	1.833	2.262	2.574	2.821	3.250	4.297	5.291
10	1.093	1.372	1.812	2.228	2.527	2.764	3.169	4.144	5.049
11	1.088	1.363	1.796	2.201	2.491	2.718	3.106	4.025	4.863
12	1.083	1.356	1.782	2.179	2.461	2.681	3.055	3.930	4.717
13	1.079	1.350	1.771	2.160	2.436	2.650	3.012	3.852	4.597
14	1.076	1.345	1.761	2.145	2.415	2.625	2.977	3.787	4.499
15	1.074	1.341	1.753	2.131	2.397	2.602	2.947	3.733	4.417
16	1.071	1.337	1.746	2.120	2.382	2.583	2.921	3.686	4.346
17	1.069	1.333	1.740	2.110	2.368	2.567	2.898	3.646	4.286
18	1.067	1.330	1.734	2.101	2.356	2.552	2.878	3.611	4.233
19	1.066	1.328	1.729	2.093	2.346	2.539	2.861	3.579	4.187
20	1.064	1.325	1.725	2.086	2.336	2.528	2.845	3.552	4.146
21	1.063	1.323	1.721	2.080	2.328	2.518	2.831	3.527	4.109
22	1.061	1.321	1.717	2.074	2.320	2.508	2.819	3.505	4.077
23	1.060	1.319	1.714	2.069	2.313	2.500	2.807	3.485	4.047
24	1.059	1.318	1.711	2.064	2.307	2.492	2.797	3.467	4.021
25	1.058	1.316	1.708	2.060	2.301	2.485	2.787	3.450	3.997
26	1.058	1.315	1.706	2.056	2.296	2.479	2.779	3.435	3.974
27	1.057	1.314	1.703	2.052	2.291	2.473	2.771	3.421	3.954
28	1.056	1.313	1.701	2.048	2.286	2.467	2.763	3.408	3.935
29	1.055	1.311	1.699	2.045	2.282	2.462	2.756	3.396	3.918
30	1.055	1.310	1.697	2.042	2.278	2.457	2.750	3.385	3.902
40	1.050	1.303	1.684	2.021	2.250	2.423	2.704	3.307	3.788
50	1.047	1.299	1.676	2.009	2.234	2.403	2.678	3.261	3.723
60	1.045	1.296	1.671	2.000	2.223	2.390	2.660	3.232	3.681
120	1.041	1.289	1.658	1.980	2.196	2.358	2.617	3.160	3.578
Z critical value	1.036	1.282	1.645	1.960	2.170	2.326	2.576	3.090	3.290
Level of Significance for a one-tailed test	0.15	0.10	0.05	0.025	0.015	0.01	0.005	0.001	0.0005
Level of Significance for a two-tailed test	0.30	0.20	0.10	0.05	0.03	0.02	0.01	0.002	0.001