

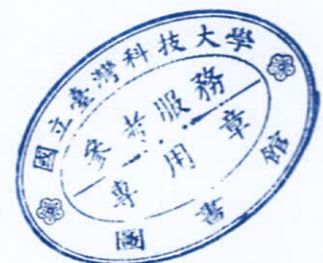
國立臺灣科技大學 107 學年度碩士班招生試題

系所組別：企業管理系碩士班

科目：統計學

(總分為 100 分)

- 1 Suppose that a race car driver will drive in 3 races and has 20% probability of winning in each race. It is assumed that his performances in these races are independent. The driver signs a contract with an advertiser. The advertiser will pay the driver a bonus of \$5,000 if he wins one race, \$12,000 if he wins two races, and \$20,000 if he wins all three. But the driver will pay the advertiser \$5,000 if he can not win any race. What is the expected amount of bonus for the driver? (20 points)
- 2 A university has routinely surveyed their graduates to get the salaries they earn. The data of a sample of 5 graduates show their years after graduation and their current salary to be (1.3 years, \$23,000), (5.0 years, \$25,000), (0.8 years, \$19,000), (1.9 years, \$24,000) and (1.1 years, \$21,000).
Based on the sample covariance between the number of years after graduation and the current salary from this sample, what can you say about the relationship of these 2 variables? Please carry 2 decimal places in your calculation. (20 points)
- 3 A survey shows that the length of time an internet user surfed the web on Dec. 31, 2017 follows a normal distribution with a mean of 120 minutes and a standard deviation of 20 minutes. If we draw an internet user randomly, what's the difference of the probabilities for the following 2 events? (10 points)
Event I: This user logged on to the internet on Dec. 31, 2017 for more than 145 minutes.
Event II: This user logged on to the internet on Dec. 31, 2017 for less than 105 minutes.



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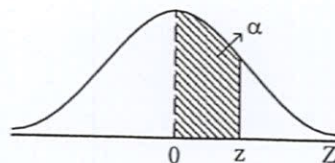
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附表 1 z 分配表

$$P(0 < Z < z) = \alpha$$



z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.0000	0.0040	0.0080	0.0120	0.0160	0.0199	0.0239	0.0279	0.0319	0.0359
0.1	0.0398	0.0438	0.0478	0.0517	0.0557	0.0596	0.0636	0.0675	0.0714	0.0753
0.2	0.0793	0.0832	0.0871	0.0910	0.0948	0.0987	0.1026	0.1064	0.1103	0.1141
0.3	0.1179	0.1217	0.1255	0.1293	0.1331	0.1368	0.1406	0.1443	0.1480	0.1517
0.4	0.1554	0.1591	0.1628	0.1664	0.1700	0.1736	0.1772	0.1808	0.1844	0.1879
0.5	0.1915	0.1950	0.1985	0.2019	0.2054	0.2088	0.2123	0.2157	0.2190	0.2224
0.6	0.2257	0.2291	0.2324	0.2357	0.2389	0.2422	0.2454	0.2486	0.2517	0.2549
0.7	0.2580	0.2611	0.2642	0.2673	0.2704	0.2734	0.2764	0.2794	0.2823	0.2852
0.8	0.2881	0.2910	0.2939	0.2967	0.2995	0.3023	0.3051	0.3078	0.3106	0.3133
0.9	0.3159	0.3186	0.3212	0.3238	0.3264	0.3289	0.3315	0.3340	0.3365	0.3389
1.0	0.3413	0.3438	0.3461	0.3485	0.3508	0.3531	0.3554	0.3577	0.3599	0.3621
1.1	0.3643	0.3665	0.3686	0.3708	0.3729	0.3749	0.3770	0.3790	0.3810	0.3830
1.2	0.3849	0.3869	0.3888	0.3907	0.3925	0.3944	0.3962	0.3980	0.3997	0.4015
1.3	0.4032	0.4049	0.4066	0.4082	0.4099	0.4115	0.4131	0.4147	0.4162	0.4177
1.4	0.4192	0.4207	0.4222	0.4236	0.4251	0.4265	0.4279	0.4292	0.4306	0.4319
1.5	0.4332	0.4345	0.4357	0.4370	0.4382	0.4394	0.4406	0.4418	0.4429	0.4441
1.6	0.4452	0.4463	0.4474	0.4484	0.4495	0.4505	0.4515	0.4525	0.4535	0.4545
1.7	0.4554	0.4564	0.4573	0.4582	0.4591	0.4599	0.4608	0.4616	0.4625	0.4633
1.8	0.4641	0.4649	0.4656	0.4664	0.4671	0.4678	0.4686	0.4693	0.4699	0.4706
1.9	0.4713	0.4719	0.4726	0.4732	0.4738	0.4744	0.4750	0.4756	0.4761	0.4767
2.0	0.4772	0.4778	0.4783	0.4788	0.4793	0.4798	0.4803	0.4808	0.4812	0.4817
2.1	0.4821	0.4826	0.4830	0.4834	0.4838	0.4842	0.4846	0.4850	0.4854	0.4857
2.2	0.4861	0.4864	0.4868	0.4871	0.4875	0.4878	0.4881	0.4884	0.4887	0.4890
2.3	0.4893	0.4896	0.4898	0.4901	0.4904	0.4906	0.4909	0.4911	0.4913	0.4916
2.4	0.4918	0.4920	0.4922	0.4925	0.4927	0.4929	0.4931	0.4932	0.4934	0.4936
2.5	0.4938	0.4940	0.4941	0.4943	0.4945	0.4946	0.4948	0.4949	0.4951	0.4952
2.6	0.4953	0.4955	0.4956	0.4957	0.4959	0.4960	0.4961	0.4962	0.4963	0.4964
2.7	0.4965	0.4966	0.4967	0.4968	0.4969	0.4970	0.4971	0.4972	0.4973	0.4974
2.8	0.4974	0.4975	0.4976	0.4977	0.4977	0.4978	0.4979	0.4979	0.4980	0.4981
2.9	0.4981	0.4982	0.4982	0.4983	0.4984	0.4984	0.4985	0.4985	0.4986	0.4986
3.0	0.4987	0.4987	0.4987	0.4988	0.4988	0.4989	0.4989	0.4989	0.4990	0.4990
3.1	0.4990	0.4991	0.4991	0.4991	0.4992	0.4992	0.4992	0.4992	0.4993	0.4993
3.2	0.4993	0.4993	0.4994	0.4994	0.4994	0.4994	0.4994	0.4995	0.4995	0.4995
3.3	0.4995	0.4995	0.4995	0.4996	0.4996	0.4996	0.4996	0.4996	0.4996	0.4997
3.4	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4998
3.5	0.4998	0.4998	0.4998	0.4998	0.4998	0.4998	0.4998	0.4998	0.4998	0.4998



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4. 陳經理第一年投資台積電股票每股市價 50 元，第一年台積電股票每股市價 60 元，而第二年底台積電股票每股市價 50 元，試求陳經理兩年度投資台積電股票的總報酬率與每年平均報酬率。
(總報酬率五分、每年平均報酬率五分)
5. 試求算下列樣本資料的變異數與標準差:4, 7, 9, 22, 8。(變異數五分、標準差五分)
6. 請解釋點二項分配(point binomial distribution)。(十分)
7. 有一批產品不良率為 3%，現隨機抽樣一件產品，令 x 為不良品件數的隨機變數，請
- (a)寫出 x 之機率分配方程式 $f(x)$ 。(四分)
- (b)期望值 $E(x)$ 。(三分)
- (c)變異數 $V(x)$ 。(三分)
8. 全校 10,000 人參加會考，其成績為常態分配，平均數=500 分，標準差=50 分，試求符合下列條件之人數為若干？
- (a)500 分以上者。(五分)
- (b)未滿 350 分以上者。(五分)

