

Math-009-01 (Introduction to Statistics)**FINAL**

Maximum Score-200 Points

TO GET FULL CREDIT, SHOW ALL YOUR WORK. EACH PROBLEM IS WORTH 20 POINTS.

1. The following data represents the number of miles per gallon that 30 selected 4-Wheel Drive Sports Utility vehicles obtained in city driving.

12	17	12	14	16	18
16	18	12	16	17	15
15	16	12	15	15	14
12	14	15	12	16	16
19	13	16	18	16	15

- a) Construct a frequency distribution, using eight classes
- b) Construct a histogram for the data
2. The calories per serving of 11 fruit juices are as shown below
- 150, 110, 100, 35, 60, 130, 40, 140, 120, 160, 110.
- Find the mean, median and mode.
3. In a class of 29 students, the following distribution of quiz scores were recorded.

Grade	Frequency
0 – 2	1
3 – 5	3
6 – 8	5
9 – 11	14
12 – 14	6

- a) What proportions of students scored 8 or less?
- b) Find the mean, variance and standard deviation of the distribution.

4. a) How many different ways can a chair person and an assistant chair person be selected for a research project if there are seven scientists available?
- b) One company's ID cards consists of 5 digits 1, 2, 3, 4, 5. How many cards can be made if repetitions are allowed?
5. A sample of hourly wages of employees who work in a restaurant in a large city has a mean of \$5 and a standard deviation of \$1. Using Chebychev's theorem
- a) Find the range in which 75% of the data values will fall.
- b) Find the minimum percentage of data values that will fall between 2 and 8.
6. In a shopping mall, a marketing agency conducted a survey on credit cards. The results are shown in the following table.

Employment status	Own a credit card	Does not own a credit card
Employed	18	29
Unemployed	28	34

- If a person is selected at random, find the probability,
- a) that the person owns a credit card given that the person is employed.
- b) that the person is employed or owned a credit card.
7. A die is rolled 6 times. Let X denote the number of 2's that appear on the die.
- a) Show that X is binomial.
- b) What is the probability of getting at least one 2.
- c) Find the mean and the standard deviation of X .

8. A student randomly guesses 5 multiple choice questions. Let X denote the number of correct answers the student gets.

a) Give reasons why X is binomial.

b) Find the probability that the student gets exactly 3 correct answers.

c) Find the probability that the student gets at least 3 correct answers.

9. Using the standard normal distribution, find each probability

a) $P\{-1.75 < z < 2.15\}$

b) $P\{z > 1.79\}$

10. The average height of a certain group of people is 53 inches. The standard deviation is 4 inches. If the variable is normally distributed, find the probability that the selected individual's height is

a) less than 51 inches.

b) between 51 and 56 inches.

[Show work, draw pictures, corresponding to each case]

Table E The Standard Normal Distribution

<i>z</i>	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.0000	.0040	.0080	.0120	.0160	.0199	.0239	.0279	.0319	.0359
0.1	.0398	.0438	.0478	.0517	.0557	.0596	.0636	.0675	.0714	.0753
0.2	.0793	.0832	.0871	.0910	.0948	.0987	.1026	.1064	.1103	.1141
0.3	.1179	.1217	.1255	.1293	.1331	.1368	.1406	.1443	.1480	.1517
0.4	.1554	.1591	.1628	.1664	.1700	.1736	.1772	.1808	.1844	.1879
0.5	.1915	.1950	.1985	.2019	.2054	.2088	.2123	.2157	.2190	.2224
0.6	.2257	.2291	.2324	.2357	.2389	.2422	.2454	.2486	.2517	.2549
0.7	.2580	.2611	.2642	.2673	.2704	.2734	.2764	.2794	.2823	.2852
0.8	.2881	.2910	.2939	.2967	.2995	.3023	.3051	.3078	.3106	.3133
0.9	.3159	.3186	.3212	.3238	.3264	.3289	.3315	.3340	.3365	.3389
1.0	.3413	.3438	.3461	.3485	.3508	.3531	.3554	.3577	.3599	.3621
1.1	.3643	.3665	.3686	.3708	.3729	.3749	.3770	.3790	.3810	.3830
1.2	.3849	.3869	.3888	.3907	.3925	.3944	.3962	.3980	.3997	.4015
1.3	.4032	.4049	.4066	.4082	.4099	.4115	.4131	.4147	.4162	.4177
1.4	.4192	.4207	.4222	.4236	.4251	.4265	.4279	.4292	.4306	.4319
1.5	.4332	.4345	.4357	.4370	.4382	.4394	.4406	.4418	.4429	.4441
1.6	.4452	.4463	.4474	.4484	.4495	.4505	.4515	.4525	.4535	.4545
1.7	.4554	.4564	.4573	.4582	.4591	.4599	.4608	.4616	.4625	.4633
1.8	.4641	.4649	.4656	.4664	.4671	.4678	.4686	.4693	.4699	.4706
1.9	.4713	.4719	.4726	.4732	.4738	.4744	.4750	.4756	.4761	.4767
2.0	.4772	.4778	.4783	.4788	.4793	.4798	.4803	.4808	.4812	.4817
2.1	.4821	.4826	.4830	.4834	.4838	.4842	.4846	.4850	.4854	.4857
2.2	.4861	.4864	.4868	.4871	.4875	.4878	.4881	.4884	.4887	.4890
2.3	.4893	.4896	.4898	.4901	.4904	.4906	.4909	.4911	.4913	.4916
2.4	.4918	.4920	.4922	.4925	.4927	.4929	.4931	.4932	.4934	.4936
2.5	.4938	.4940	.4941	.4943	.4945	.4946	.4948	.4949	.4951	.4952
2.6	.4953	.4955	.4956	.4957	.4959	.4960	.4961	.4962	.4963	.4964
2.7	.4965	.4966	.4967	.4968	.4969	.4970	.4971	.4972	.4973	.4974
2.8	.4974	.4975	.4976	.4977	.4977	.4978	.4979	.4979	.4980	.4981
2.9	.4981	.4982	.4982	.4983	.4984	.4984	.4985	.4985	.4986	.4986
3.0	.4987	.4987	.4987	.4988	.4988	.4989	.4989	.4989	.4990	.4990

Note: Use 0.4999 for *z* values above 3.09.

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