

Name:

ID number:

Time: 1 hour

Math 204
Quiz II
Second Semester 05/06

8/04/06

Instructor: Mrs. Muna Jurdak

Section 1 Thurs. 11:00 a.m.

Section 2: Fri. 1:00 p.m.

Section 3: Thurs. 3:30 p.m.

Section 4: Thurs. 2:00 p.m.

Instructions:

1. Write your name and ID number clearly where indicated.
2. Circle your section number above, according to the time of the problem solving session in which you are enrolled.
3. **Solve the problems on this, the white question sheet.** Use the colored sheets for scratch work only. You may use the back of a white sheet to complete the solution of a problem.
4. Give numerical answers correct to 2 decimal places.
5. **Show your work** in all the problems.

1	2	3	4	5	6	7	8	Total
/12	/10	/10	/15	/8	/17	/10	/18	/100

(12%) 1. (a) Find $\frac{dy}{dx}$ for $y = (e^{x^2})\ln(\sqrt{x} + 1)$ s

(b) Find $f(1)$ for $f(x) = \frac{10+x}{(x^3+1)^3}$.

(c) Use the chain rule to find $\frac{dy}{dx}$, if $y = \frac{u-1}{u+1}$, and $u = (x^2 - 3x + 1)^{1/3}$.

(10%) 2. (a) Find $\int(\sqrt{5x} + \frac{3}{\sqrt{x}} - 21x^6 - 1)dx$.

(b) If $g''(x) = \frac{-2}{x^3} + 2$, $g'(1) = 5$ and $g(1) = 9$, find $g(x)$.

(10%) 3. The frequency distribution for a random variable X is given below.

X	1	2	3	6
Frequency	40	20	60	80

(a) Construct the probability distribution of X.

(b) Find $p(X \geq 2)$.

(c) Find $p(X > 6)$.

(15%) 4. The time it takes a college freshman to complete a certain reasoning test is normally distributed, with a mean of 25 minutes and standard deviation equal to 6 minutes.

(a) Find the probability that, a student chosen at random, will take between 10 and 20 minutes to finish the test.

(b) Find the probability that, a student, chosen at random, will take between 5 and 45 minutes to finish the test.

(c) Find the time t_1 below which only 20% of the students take to finish the test.

CHAPTER 14 PROBABILITY DISTRIBUTIONS

Area Under the Standard Normal Curve

	.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	.2518	.2549
0.7	.2580	.2612	.2642	<u>.2673</u>	.2704	<u>.2734</u>	.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	<u>.4965</u>	.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	.49865	.4987	.4987	.4988	.4988	.4989	.4989	.4989	.4990	.4990



(8%) 5. A box contains 4 red balls and 6 white balls. An experiment consists of drawing 5 balls at random from the box, with replacement. Find the probability that at least 3 of the balls are red.

(17%) 6. Of 120 students, 60 are studying French, 50 are studying Spanish, and 20 are studying both French and Spanish.

(a) A student is chosen at random. Find the probability that:

(i) The student is studying neither French nor Spanish.

(ii) The student is studying exactly one of the two languages.

(iii) The student is studying French, given that he is studying Spanish.

(b) Let F be the event that the student is studying French, and S be the event that the student is studying Spanish. Are F and S statistically independent events? Give a clear reason for your answer.

(10%) 7. The scores on a quiz for a class of 40 students have a mean equal to 75 and a standard deviation equal to 9. If the teacher decides to raise each student's grade by 2 grades

(a) What will be the new mean (of the raised grades)? Justify your answer.

(b) What will be the new standard deviation? Justify your answer.

(18%) 8. A pair of dice, one red, one green, is rolled once. The random variable X is the maximum of the 2 numbers obtained on the faces of the dice.

(a) If A is the event that $X = 3$, list the set of outcomes belonging to this event.

(b) Find the probability that $X \leq 3$.

(c) Find the probability that $X \neq 3$.

(d) Let A be the event that $X = 3$, B be the event that X is even, and C be the event that $X \geq 4$.

(i) Are the events A , B and C mutually exclusive? Justify your answer.

(ii) Are the events A , B and C collectively exhaustive? Justify your answer.