

MATH 210 **PRACTICE EXAM 2**
Semester I, 2007-2008 Lecture 1

Name: _____

Circle your TA and section number on each sheet

TA: Loizos Antonio Meghan
 Section: 301 302 311 312 303 304 305 306 307 308 309 310

sections

Loizos		Antonio		Meghan	
M, 7:45	301	M, 8:50	303	M, 12:05	307
W, 7:45	302	W, 8:50	304	W, 12:05	308
M, 2:25	311	M, 9:55	305	M, 1:20	309
W, 2:25	312	W, 9:55	306	W, 1:20	310

NO CALCULATORS, NOTES, BOOKS, ETC. ALLOWED.
EXPLAIN YOUR WORK.

Unless you are instructed otherwise, your answer should be computed completely (e.g., as a whole number, or a simple fraction, or a decimal).

A table of the areas under the standard normal curve is on the back of this page.

Number	MAX	Grade
1	10	
2	15	
3	10	
4	15	
5	12	
6	15	
7	13	
8	10	
SUM	100	

Area under the Standard Normal Curve

z	.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

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1. (10 points) A fair die is rolled 9 times. Assume that the results of the rolls are independent. Find the probability that your sequence of 9 rolls contains an even number of ones. For example, 3, 2, 1, 5, 6, 6, 1, 2, 3 has 2 ones; 6, 2, 4, 5, 6, 6, 4, 2, 3 has 0 ones. You may leave your answer as an arithmetical expression, without evaluating it.

2. (15 points) Consider the following experiment: You start with a deck of 4 cards, $\{\diamond 3, \diamond 4, \diamond 5, \diamond 6\}$. Now, shuffle the deck and deal them out on the table, one at a time; STOP when the sum of the numbers is 8 or greater. Find the probability that the last card dealt is the $\diamond 5$. Assume that the deal is a fair deal.

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3. (10 points) A random variable X has the density function shown below. Find the expected value, $E(X)$.

Value of X	Probability
-20	0.05
-10	0.2
0	0.3
10	0.1
20	0.15
30	0.2

4. (15 points) Consider the following experiment: You start with a deck of 5 cards, $\{\diamond 2, \diamond 3, \diamond 4, \diamond 5, \diamond 6\}$. Now, shuffle the deck and deal out exactly two. Let X be the sum of the two numbers you get. Find the expected value, variance, and standard deviation of X . Assume that the deal is a fair deal. You may leave the result for $\sigma(X)$ in terms of a $\sqrt{\quad}$.

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5. (12 points) Let X be a normal random variable with $\mu = E(X) = 73$ and $\sigma(X) = 10$. Find $\Pr[70 \leq X \leq 80]$.

6. (15 points) An unfair coin is tossed 625 times. The coin has probability $\frac{1}{5}$ of coming up heads. Use the normal approximation to the binomial to estimate the probabilities of the following happening:

- a. You get between 120 and 140 heads
- b. You get 135 or fewer heads.

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7. (13 points) Let X be a random variable with probability density function f , where

$$f(x) = \begin{cases} 0 & \text{if } x < -2 \\ 0.3 & \text{if } -2 \leq x < 0 \\ 0.1 & \text{if } 0 \leq x < 4 \\ 0 & \text{if } 4 \leq x \end{cases}$$

Find $\Pr[X \geq -1 \mid X \leq 3]$ and $\Pr[X \leq 3 \mid X \geq -1]$.

8. (10 points) Solve the system of equations:

$$6x + 5y = 3 \qquad 2x + 3y = 5$$

There is a unique solution here.

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