Math 120, Exam 2  
Print Name: ______________________________
Spring 2007, Sections 4.1-6.1

Instructions: Show your work. Write all probabilities as fractions or to the nearest ten-thousandth (i.e. 4 decimal places, 0.0301).

**Answer Key**
1. see 4.1 #9  
2. see Notes  
3. see 4.2 #7  
4. see 4.2 #9  
5. see 4.3 #21  
6. See 4.3 #29  
7. see 5.2 #9  
8. see Notes  
9. see Notes  
10. see 5.4 #15  
11. See Notes

**HW problems graded for Exam 2**
4.2 #9d, Chapter 4 Review #8, 5.2 #9a, 5.3 #17d, 5.4 #7c

1. When do creative people get their best ideas? USA Today did a survey of 966 inventors, who hold patents, and found the information in the table. Estimate the probability that an inventor has a best idea during each time interval. Fill-in the table.

<table>
<thead>
<tr>
<th>Time</th>
<th>Number of Inventors</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 a.m. – 12 noon</td>
<td>290</td>
<td></td>
</tr>
<tr>
<td>12 noon – 6 p.m.</td>
<td>135</td>
<td></td>
</tr>
<tr>
<td>6 p.m. – 12 midnight</td>
<td>319</td>
<td></td>
</tr>
<tr>
<td>12 midnight – 6 a.m.</td>
<td>222</td>
<td></td>
</tr>
</tbody>
</table>

2. About 14% of senior citizens (65 years or older) get the flu each year, and about 24% of the people under 65 years old get the flu each year. In the general population, there are 12.5% senior citizens. What is the probability that a person selected at random
a. is a senior citizen who will get the flu?

b. is a person under 65 who will get the flu?

3. You roll two fair dice, a red one and a green one. What is the probability of getting a sum of a 6?
4. You draw two cards from a standard deck of 52 cards without replacing the first one before drawing the second. Find the probability of drawing an ace on the first and a king on the second.

5. There are three nursing positions to be filled at Lily Hospital – the day nursing supervisor, a night nurse, and a nursing coordinator. There are 15 candidates qualified for all three positions. Determine the number of different ways the positions can be filled by these applicants.

6. The qualified applicant pool for six management trainee positions consists of seven women and five men. The applicants are all equally qualified and the positions are randomly filled by six of the applicants.
   a. How many different groups of applicants can be selected for the 6 positions?
   b. How many groups of 6 trainees would consist entirely of women?
   c. What is the probability that all six positions will be filled by women?
   d. What is the probability that all six positions will be filled by men?
7. After examination of daily receipts over the past year, it was found that
the Green Parrot Restaurant has been grossing over $2200 a day for
about 85% of its business days. Find the probability that the Green
Parrot Restaurant will gross over $2200
a. at least 5 days in the next 7 business days.

b. fewer than 3 days in the next 5 business days.

c. Find the expected value for part b and explain its meaning in this
application.

d. Find the standard deviation for part b.

8. The Denver Post reported that a recent audit of 911 calls showed that
82% were not emergencies. Find the minimum number of calls that 911
operators need to answer to be 97% sure that at least one call was in
fact an emergency.
9. Bob, a recent law school graduate, intends to take the bar exam which has a 57% passing rate. What is the probability that Bob
a. passes the exam on the second try?

b. needs more than four attempts to pass the exam?

10. Jim is a real estate agent who sells large commercial buildings. He has a record of selling, on average, 8 buildings in 275 days.
a. In a 60-day period, what is the probability that Jim will make at least 3 sales?

b. In a 90-day period, what is the probability that Jim will make no sales?

11. The playing life of a Sunshine radio is normally distributed with a mean of 600 hours and a standard deviation of 100 hours. Use the empirical rule to find the probability that a randomly selected radio will last greater than 700 hours?
Math 120, Exam 2       Print Name: ______________________________
Spring 2007, Sections 4.1-6.1, v. 2

Instructions: Show your work. Write all probabilities as fractions or to the nearest ten-thousandth (i.e. 4 decimal places, 0.0301).

1. When do creative people get their best ideas? USA Today did a survey of 1056 inventors, who hold patents, and found the information in the table. Estimate the probability that an inventor has a best idea during each time interval. Fill-in the table.

<table>
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<tr>
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<th>Probability</th>
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</thead>
<tbody>
<tr>
<td>6 a.m. – 12 noon</td>
<td>320</td>
<td></td>
</tr>
<tr>
<td>12 noon – 6 p.m.</td>
<td>135</td>
<td></td>
</tr>
<tr>
<td>6 p.m. – 12 midnight</td>
<td>349</td>
<td></td>
</tr>
<tr>
<td>12 midnight – 6 a.m.</td>
<td>252</td>
<td></td>
</tr>
</tbody>
</table>

2. About 15% of senior citizens (65 years or older) get the flu each year, and about 24% of the people under 65 years old get the flu each year. In the general population, there are 13.5% senior citizens. What is the probability that a person selected at random
   a. is a senior citizen who will get the flu?

   ____________________________
   answer

   b. is a person under 65 who will get the flu?

   ____________________________
   answer

3. You roll two fair dice, a red one and a green one. What is the probability of getting a sum of a 5?

   ____________________________
   answer
4. You draw two cards from a standard deck of 52 cards without replacing the first one before drawing the second. Find the probability of drawing and ace on the first and a king on the second.

5. There are three nursing positions to be filled at Lily Hospital – the day nursing supervisor, a night nurse, and a nursing coordinator. There are 17 candidates qualified for all three positions. Determine the number of different ways the positions can be filled by these applicants.

6. The qualified applicant pool for six management trainee positions consists of eight women and five men. The applicants are all equally qualified and the positions are randomly filled by six of the applicants.
   a. How many different groups of applicants can be selected for the 6 positions?

   b. How many groups of 6 trainees would consist entirely of women?

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   a. passes the exam on the second try?

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   answer

10. Jim is a real estate agent who sells large commercial buildings. He has a record of selling, on average, 8 buildings in 295 days.
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   answer

   b. In a 90-day period, what is the probability that Jim will make no sales?

   answer

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   answer