MATH 132 - Exam 3 Review

All material covered in class is eligible for exam, this review is not all inclusive.

1. (6.3) A test consists of ten true-or-false questions. If a student randomly chooses answers for each question, find the probability that the student:

   (a) answers exactly 7 questions correctly (round to 2 decimal places).
   (b) answers at least 1 question correctly (round to 3 decimal places).

2. (6.4) A box contains 9 red balls and 8 white balls. A random sample of 7 balls is drawn. Find the probability that the sample contains 4 red balls and 3 white balls (round to 2 decimal places).

3. (6.4) Five numbers are chosen at random from the whole numbers between 1 and 13, inclusive, without replacement. What is the probability that:

   (a) all the numbers are even?
   (b) all the numbers are odd?
   (c) at least one of the numbers is odd?

4. (6.4) In a certain manufacturing process the probability of a type I defect is 0.12, the probability of a type II defect is 0.22, and the probability of having both types of defects is 0.02. Find the probability of having neither defect.

5. (6.5) Enrollment statistics at a certain college show that 55% of all students are men, 18% of the student body consists of women majoring in business, and 40% of all students major in business. A student is selected at random. Find the conditional probability that the person majors in business if we are certain the person is a woman.

6. (6.5) The probability that a fisherman catches a tuna in any one trip is 0.15. What is the probability, rounded to 3 places, that he catches a tuna on:

   (a) each of three excursions?
   (b) at least one of three excursions?
7. (6.6) Draw a tree diagram to illustrate the following situation and answer the question. A training program is used by a corporation to direct hirees to appropriate jobs. The program consists of 2 steps. Step I identifies 30% as management trainees, 60% as non-managerial workers, and 10% to be fired. In step II, 75% of the management trainees are assigned to managerial positions and 5% are fired. In step II, 60% of the non-managerial workers are kept in the same category, 10% are assigned to management positions, and 30% are fired. What percentage (rounded to the nearest whole number) are fired?

8. (6.6) The probability that Rachael will spend her next summer in Europe is 0.6 and the probability that she will stay in town and take summer classes is 0.4. If she goes to Europe, the probability that she will go to Spain and learn Spanish is 0.8. If she stays in town the probability that she will take a Spanish class is 0.1. Draw a tree diagram and find the probability that:

(a) Rachael will go to Europe but won’t be learning Spanish.
(b) Rachael will be learning Spanish.

9. (6.7) In Oak Tree County, 40% of the registered voters are Republicans, 50% are Democrats, and 10% are Independents. 70% of Republican voters voted for Candidate A, 30% of Democrat voters voted for Candidate A, and 60% of Independent voters voted for Candidate A. If a randomly chosen voter voted for A, what is the probability, rounded to 3 decimal places, that the voter is a Democrat? (Hint: Use a tree diagram).

10. (6.4) In a family with 3 children, excluding multiple births, what is the probability of having 2 boys and 1 girl, in that order? Assume that a boy is as likely as a girl at each birth.

11. (6.4) In a family with 3 children, excluding multiple births, what is the probability of having 2 boys and 1 girl, in any order? Assume that a boy is as likely as a girl at each birth.
12. (6.4) Suppose that 6 female and 5 male applicants have been successfully screened for 5 positions. If the 5 positions are filled at random from the 11 finalists, what is the probability of selecting:

(a) 3 females and 2 males.
(b) 4 females and 1 male.
(c) 5 females.
(d) at least 4 females.

13. (6.4) From a survey involving 1,000 students at a large university, a market research company found that 750 students owned stereos, 450 owned cars, and 350 owned cars and stereos. If a student at the university is selected at random, what is the probability that:

(a) the student owns either a car or a stereo.
(b) the student owns neither a car or a stereo.

14. (6.4) In order to test a new car, an automobile manufacturer wants to select 4 employees to test drive a car for 1 year. If 12 management and 8 union employees volunteer to be test drivers and the selection is made at random, what is the probability that at least 1 union employee is selected?

15. (6.4) A shipment of 60 inexpensive digital watches, including 9 that are defective, is sent to a department store. The receiving department selects 10 watches at random for testing and rejects the whole shipment if 1 or more in the sample are found to be defective. What is the probability that the shipment will be rejected?

16. (6.4) In 2 throws of a die what is the probability that you will get an even number on each throw? An even number on the first or second throw?

17. (6.4) In 2 throws of a fair die what is the probability that you will get at least 5 on each throw?
18. (6.4) Two balls are drawn in succession, without replacement, out of a box containing 2 red and 5 white balls. Find the probability that:

(a) the second ball is red.
(b) at least 1 ball is red.
(c) both balls are the same color.

19. (6.5) The following table shows probabilities for red-green color blindness, where M represents male, F represents female, C represents color-blind and C’ represents not color-blind. Find the probability that:

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>F</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>0.035</td>
<td>0.004</td>
<td>0.039</td>
</tr>
<tr>
<td>C’</td>
<td>0.452</td>
<td>0.509</td>
<td>0.961</td>
</tr>
<tr>
<td>Totals</td>
<td>0.487</td>
<td>0.513</td>
<td>1.000</td>
</tr>
</tbody>
</table>

(a) A randomly selected person is either male or color-blind.
(b) The conditional probability that a female is color blind.

20. (6.3) A fair coin is tossed six times. Find the probability that the coin lands on heads exactly once.