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| Math 208 Midterm 3 virtual |
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| 10-27-2020 |

Instructions:

1. Print the exam (alternatively, you may answer all questions on extra paper provided each answer and work is clearly identified)
2. Review and sign the honor code
3. Complete the exam using extra paper if needed. (show your work)
4. Scan or photograph your completed exam and papers
5. Convert to PDF
6. Email to gdalton@uwm.edu

**Fall 2020**

**Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Math 208 – Test Chapters 5, 8**

**SHOW ALL WORK**

1. **Graph 2x – y > 3**

**A close up of a dirty field

Description automatically generated**

**2. Determine the inequalities from the graph. (example x, y 0)**

**Chart

Description automatically generated**

**3 & 4. A laboratory technician in a medical research center is asked to formulate a diet from two commercially packaged foods, food A and food B, for a group of animals. Each ounce of food A contains 8 units of fat and 16 units of carbohydrate. Each ounce of food B contains 4 units of fat and 32 units of carbohydrate. The minimum daily requirements are 176 units of fat and 1,024 units of carbohydrate. If food A costs 5¢ per ounce and food B costs 7¢ per ounce, how many ounces of each food should be used to meet the minimum daily requirements at the least cost? What is the cost for this amount of food?**

**Decision Variables: \_\_X=\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Y=\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Objective Function: \_\_Cost=\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Problem Constraints: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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**Graph the Feasible Region: (Next page)**

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| **Corner Points** | **Objective Value** |
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**How many ounces of each food? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Cost of food? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Chart

Description automatically generated**

**5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ A coin is tossed three times and a die is rolled**

**once. What is the probability that the tosses show all heads and the die shows an odd number?**

**6. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 4 thank you notes are written and 4 envelopes**

**are addressed. Accidentally the notes are randomly inserted into the envelopes and mailed without checking the addresses. What is the probability that all the notes will be inserted into the correct envelopes?**

**7. A red and a blue die are rolled. Find the probability of each of the following:**

1. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ The sum is less than 5**
2. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ The sum is 7 or 11**
3. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ The sum is 13**

**8. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ A red and a blue die are rolled. Find the**

**probability that the sum is 12 or that the roll**

**was doubles. (Doubles means both dice**

**come up with the same number).**

**For Problems 9 & 10, Recall**

**9. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ If**

**Find**

**10. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Colbey needs to pass Math 208 or Econ 101 to graduate. He believes his chance of passing Math 208 is .6 and Econ 101 is .3 and passing both is .2 What is the probability that Colbey will pass at least one of these courses?**

**For Problems 11 – 13, refer to the Venn Diagram for events A and B.**

**The set S has 90 elements in all.**

S

B

A

32

40

10

8

**11. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Find**

**12. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Find**

**13. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Find**

**14. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ If Carlos drives to Grafton, there are 6 different**

**restaurants and 4 different motels to choose from. If he drives to Cedarburg, there are 7 different restaurants and 2 different motels to choose from. If Carlos would like to eat at a restaurant and stay at a motel in the same city, how many choices does he have?**

**15. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Given a single roll of a red and blue**

**die, find the conditional probability**

**that the sum is even given that the**

**sum is less than 6.**

**16. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ An urn contains 3 red and 7 white balls.**

**Two balls are drawn from the urn. Find**

**the probability that both balls are the**

**same color given that the first ball was**

**NOT replaced before the second draw.**

**17. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ An experiment consists of tossing 3**

**coins. Let A be the event that at least 2 heads turn up, and let B be the event that all the coins turn up the same. Test A and B for independence if 3 coins are tossed.**

**18. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Referring to the tree diagram find the**

**A close up of a watch

Description automatically generatedfollowing.**

1. **P(V C) \_\_\_\_\_\_\_\_\_\_\_\_**
2. **P(W|C’) \_\_\_\_\_\_\_\_\_\_\_\_**
3. **P(C|U) \_\_\_\_\_\_\_\_\_\_\_\_\_**
4. **P(UVW) \_\_\_\_\_\_\_\_\_**

**19 a) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ A single coin is tossed twice. Find odds in favor of two heads.**

**19 b) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Find odds against two heads**

**Bayes’ Theorem S= snowing. G= glaciers growing**

**Find P (S/G) = probability that it is snowing given glaciers are growing**

**20. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ The chances of snow on a given day in Iceland is**

**5%. When it does snow, glaciers have a 30%**

**chance of growing. When it does not snow,**

**glaciers have a 6% chance of growing.**

**Find P (S/G)**

**Hint: P(S/G) =**

**FILL OUT TREE DIAGRAM TO RIGHT**

**Start**