

## MATH 1342

### Homework 2 (Sections 2.1 – 2.4)

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**Instructions:** Answer all questions through the EMCF tab of casa under the assignment named “Homework 2” before the deadline.

There is no “Submit” button. Your answers will be automatically submitted once the deadline arrives.

Assignments will be graded out of 20 points.

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1. Section 2.1; Problem 4

- A. 720
- B. 81
- C. 60
- D. 12
- E. 120

2. Section 2.1; Problem 18

- A. 420
- B. 192
- C. 43
- D. 1680
- E. 336

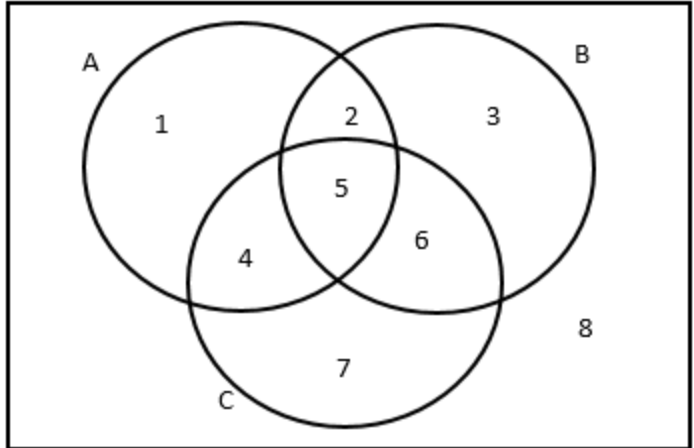
3. Section 2.2; Problem 16

- A. {1, 2, 5, 6, 9, 10}
- B. {2, 9, 10}
- C. {1, 2, 3, 5, 6, 8, 9, 10}
- D. {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}
- E. {3, 7, 8}

4. Section 2.2; Problem 40

(Select which regions to shade)

- A. Shade Regions 5, 6
- B. Shade all but Regions 5, 6
- C. Shade all but Region 6
- D. Shade Region 5 only
- E. Shade all but Region 8



5. Section 2.3; Problem 4

- A. 0.25
- B. 0.5
- C. 0.75
- D. 0.077
- E. 1.0

6. Section 2.3; Problem 6

- A. 0.25
- B. 0.5
- C. 0.75
- D. 0.077
- E. 1.0

7. Section 2.3; Problem 8

- A. 0.006
- B. 0.021
- C. 0.077
- D. 0.154
- E. 0.231

For Questions 8, 9, and 10, refer to Section 2.3; Problem 20:

8. How many ways can the desired selection be made?

- A. 45
- B. 45480
- C. 1120
- D. 15504
- E. 1960

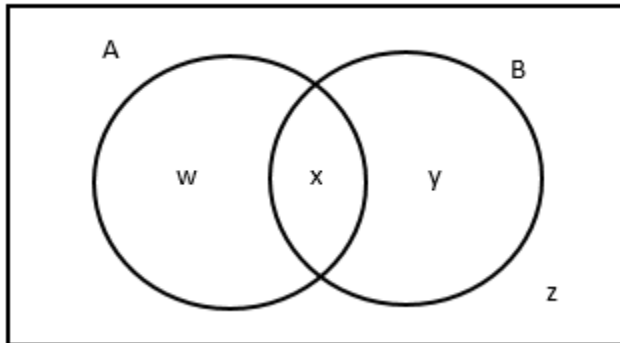
9. How many total selections are possible?

- A. 100
- B. 25
- C. 15504
- D. 3200000
- E. 1500

10. What is the probability of making the desired selection?

- A. 0.7910
- B. 0.1264
- C. 0.0402
- D. 0.0029
- E. 0.0013

For Questions 11, 12, 13, and 14, refer to Section 2.4; Problem 1 – 6 directions:



11. In the Venn diagram above, determine the probability values for  $w$  and  $x$ .

- A.  $w = 0.71$ ;  $x = 0.28$
- B.  $w = 0.71$ ;  $x = 0.99$
- C.  $w = 0.43$ ;  $x = 0.28$
- D.  $w = 0.43$ ;  $x = 0.53$
- E.  $w = 0.71$ ;  $x = 0.43$

12. In the Venn diagram above, determine the probability values of  $y$  and  $z$ .

- A.  $y = 0.25$ ;  $z = 0.04$
- B.  $y = 0.53$ ;  $z = 0.00$
- C.  $y = 0.28$ ;  $z = 0.09$
- D.  $y = 0.25$ ;  $z = 0.28$
- E.  $y = 0.53$ ;  $z = 0.04$

13. Section 2.4; Problem 4

- A. 0.3521
- B. 0.5814
- C. 0.7813
- D. 0.8621
- E. 0.6275

14. Section 2.4; Problem 6

- A. 0.0784
- B. 0.5686
- C. 0.1379
- D. 0.1429
- E. 0.0755

15. Section 2.4; Problem 16 (a)

16. Section 2.4; Problem 16 (b)

17. Section 2.4; Problem 16 (c)

18. Section 2.4; Problem 16 (d)

Choices for Questions 15, 16, 17, and 18:

- A. 0.350
- B. 0.263
- C. 0.400
- D. 0.656
- E. 0.750

19. Describe in common terminology what it means for events to be independent.

- A. If one event occurs, it is impossible for the other to occur.
- B. Either one event or the other must occur.
- C. The events have an intersection which is, by definition, empty.
- D. If one event occurs, the probability of the other event is unaffected.
- E. Both events must occur together.

20.  $P(A) = 0.40$   $P(B) = 0.25$   $P(A \cup B) = 0.50$

Part a: Find  $P(A \cap B)$

Part b: Find  $P(A|B)$

Part c: Find  $P(B|A)$

Part d: Are events A and B independent?

*Proposed Solution:*

Part a:  $P(A \cap B) = P(A) * P(B) = 0.40 * 0.25 = 0.1$

Part b:  $P(A|B) = P(A \cap B) / P(B) = 0.1 / 0.25 = 0.4$

Part c:  $P(B|A) = P(A \cap B) / P(A) = 0.1 / 0.4 = 0.25$

Part d: Yes, since  $P(A) = P(A|B)$ ;  $P(B) = P(B|A)$

What was done wrong in the proposed solution?

- A.  $P(A|B) = P(A \cup B) / P(B)$  and all other parts are using this answer.
- B. To show independence, you must verify  $P(A) * P(B) = P(A \cap B)$ .
- C. The formula used to find  $P(A \cap B)$ , in part a, only is valid for independent events which has not yet been shown.
- D.  $P(A|B) = P(A \cap B) / P(A)$ , and a similar error for  $P(B|A)$ .
- E. The proposed solution is correct.