Homework 4 Solutions

Section 4.1, starting on page 157.

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section 4.2, starting on page 166.

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section 4.3, starting on page 178.

 $7\text{-}10. \ 15, \ 16, \ 17, \ 32, \ 33, \ 36, \ 37, \ 40, \ 51, \ 61.$ 

Section 4.1.

5. The probability is 0.

- 6. The probability is 1.
- 7. sample space.

8. event.

9. True. 10. False. 11. False. 12. True.

13. P(2)=1/6.

- 14. P(even) = 1/2.
- 15. P(less than 3)= 1/3.
- 16. P(greater than 2 = 2/3
- 17. P(7)=0.
- 18. P(less than 10) = 1.
- 19. a. No. b. No. c. Yes.
- 21. No. The sum of the probabilities is not 1.
- 22. Yes, each probability is between 0 and 1, and the sum of them is 1.

26. The probability is 0.88.

29. a. The 16 possible outcomes are TTTT, TTTF, TTFT, TFTT, FTTT, TTFF, TFFF, TFFT, FTFT, FTFT, FFTT, FFFT, FFFF, FFFF, FFFF, FFFF, FFFF.

b. 2/16=1/8.

c. 1/4.

d. 3/8.

39. a. the probability is  $\frac{10040+17890}{32201} = 0.8674$ .

b.  $\frac{10040}{32201} = 0.3118.$ 

c. No. As the proportion of people who hardly have any confidence is  $\frac{4271}{32201}=0.1326$ 

which is greater than 0.05, so it is not unusual for some someone to have hardly any confidence in education.

section 4.2.

5. P(AandB)

6. 0

7. Complement

8. 1-P(A).

13. 0.75 + 0.4 - 0.25 = 0.9.

16. 0.7 + 0.1 = 0.8.

24. 0.5 as  $P(A) + P(A^C) = 1 \rightarrow 2P(A) = 1 \rightarrow P(A) = 0.5.$ 

35. a. 0.1+0.02-0.01=0.11; b.  $P(E^C) = 1 - P(E) = 1 - 0.1 = 0.90$ .

41. a. 18/25=0.72;

b.10/25 = 0.4;c.(6+12+4)/25 = 0.88;d.1-0.88 = 0.12.44. a. 1170/14518=0.0806. b. (3421+9869-2043)/14518=0.7747 c. 4149/14518=0.2858 d. 1-0.2858= 0.7142e. 178/14518 = 0.0123f. (2823+201)/14518 = 0.2083. section 4.3. 7-10. 15, 16, 17, 32, 33, 36, 37, 40, 51, 61. 7. conditional. 8. P(AandB) = P(A|B)P(B) or P(B|A)P(A). 9.510. independent. 15. P(AandB) = P(B|A)P(A) = 0.3 \* 0.4 = 0.12.16. 0.6\*0.4=0.2417. 0.2\*0.9=0.18 as A and B are independent. 32. a No because  $P(AandB) \neq P(A)P(B)$ . b. 0.6+0.9-0.5=1.0; c. No. Because P(AandB) is not 0. 33. a. P(AandB) = P(A) + P(B) - P(AorB) = 0.3;b. No. Because we can compute  $P(AandB) = 0.4 + 0.5 - 0.6 = 0.3 \neq 0.$ c. No. Because  $P(AandB) \neq P(A)P(B)$ . 36. 0.8704. P(at least one heads)=1- P( all tails)=  $1 - 0.6^4 = 0.8704$ .

- 37. The probability is (1/7)(1/6) = 1/42 = 0.0238. 40. a. 0.20. b. 0.46. c. 0.04, d. 4/20=0.20. e. 4/46=0.0870