

Unit 1 Review

Day 11

Sets and Operations and Probability



Warm-up — Review Day!

1. There are 3 quarters, 7 dimes, 13 nickels, and 27 pennies in Jonah's piggy bank. If Jonah chooses 2 of the coins at random, what is the probability that the first coin chosen is a penny and the second coin chosen is a dime? The first coin is not replaced.
2. What is the probability that Jonah draws at least one nickel?
3. Given a standard deck of cards, find $P(\text{Ace of Spades} \mid \text{black card})$.
4. Suppose 60% of all teenagers like to watch horror movies. 28% of teenagers that watch horror movie, watch movies in the dark. 76% of teenagers that do not watch horror films, watch movies with the lights on.
 - a) Create a tree diagram.
 - b) What is the probability that a teenager watches movies with the lights on?
 - c) Find $P(\text{Dark} \mid \text{Watches Horror Movies})$
 - d) If the teenagers watch movies in the dark, what is the probability that they do not watch horror films?

Warm-up — Answers!

1. There are 3 quarters, 7 dimes, 13 nickels, and 27 pennies in Jonah's piggy bank. If Jonah chooses 2 of the coins at random, what is the probability that the first coin chosen is a penny and the second coin chosen is a dime? The first coin is not replaced.

$$(27/50)(7/49)$$

$$\mathbf{27/350 = 0.0771}$$

2. What is the probability that Jonah draws at least one nickel?

$$\mathbf{1 - P(\text{no nickel})}$$

$$\mathbf{1 - (37/50)(36/49)}$$

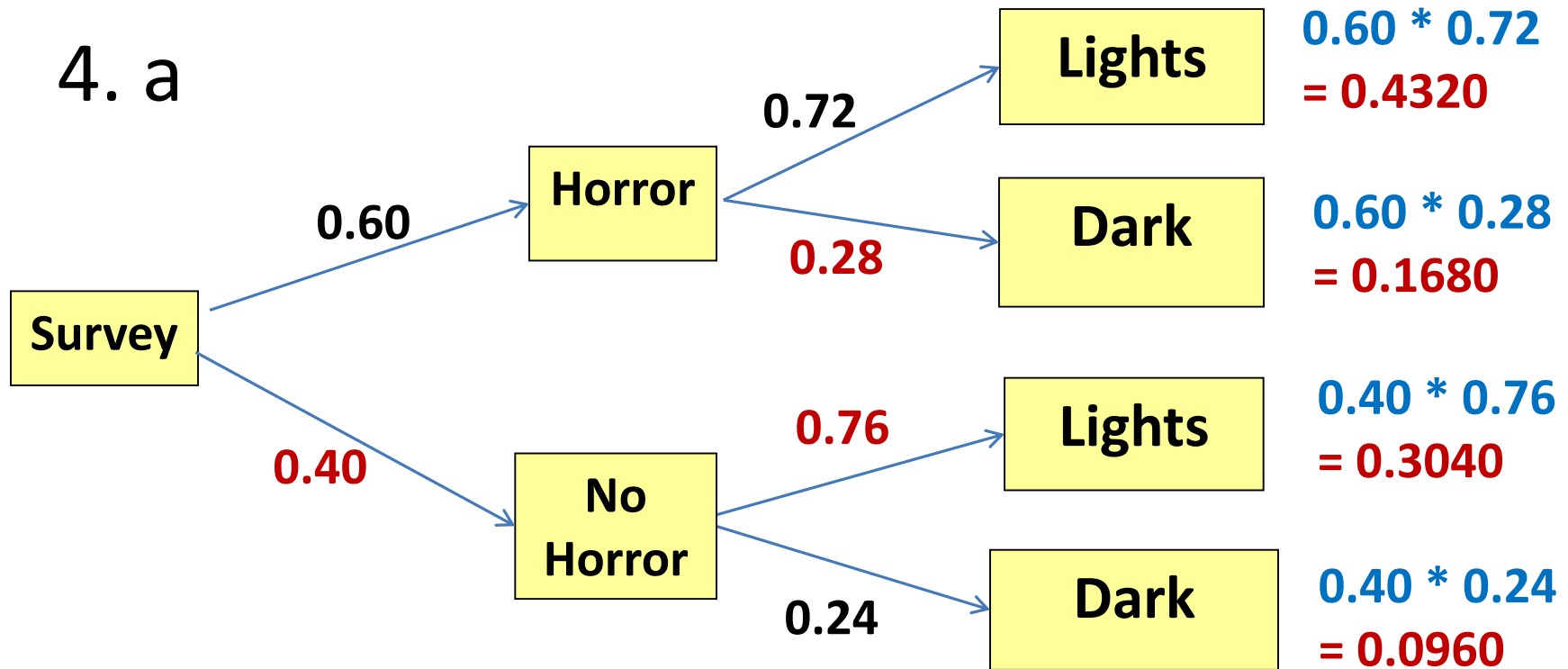
$$\mathbf{559/1225 = 0.4563}$$

3. Given a standard deck of cards, find $P(\text{Ace of Spades} \mid \text{black card})$.

$$\mathbf{1/26 = 0.0385}$$

Warm-up — Review Day!

4. a



b) What is the probability that a teenager watches movies with the lights on? **0.7360 = 73.6 %**

c) Find $P(\text{Dark} \mid \text{Watches Horror Movies})$ **0.2800 = 28%**

d) If the teenagers watch movies in the dark, what is the probability that they do not watch horror films? **0.3636 = 36.36%**

***this is a "given" problem in disguise...and you must use the given formula**

Summary of Formulas- Quiz Yourself!

Write the correct formulas for each: (Hint: Use your notes!)

1. Probability of an event E in a uniform sample space
2. Probability of union of two mutually exclusive events E and F
3. Addition Rule (union of any two events E and F)
4. Rule of Complements
5. Probability of At Least One Event E
6. Probability of Two Consecutive Events E and F
7. Conditional Probability
8. Test for Independent Events
9. Permutation
10. Combination

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Homework Questions?!



HW #15) A pair of fair dice is cast. Let E denote the event that the number falling uppermost in the first die is 5 and let F denote the event that the sum of the numbers falling uppermost is 10.

a. $P(F)$

b. $P(E \cap F)$

c. $P(F|E)$

d. $P(E)$

e. Are E and F independent events?

Die	1	2	3	4	5	6
1	(1, 1)	(1, 2)	(1, 3)	(1, 4)	(1, 5)	(1, 6)
2	(2, 1)	(2, 2)	(2, 3)	(2, 4)	(2, 5)	(2, 6)
3	(3, 1)	(3, 2)	(3, 3)	(3, 4)	(3, 5)	(3, 6)
4	(4, 1)	(4, 2)	(4, 3)	(4, 4)	(4, 5)	(4, 6)
5	(5, 1)	(5, 2)	(5, 3)	(5, 4)	(5, 5)	(5, 6)
6	(6, 1)	(6, 2)	(6, 3)	(6, 4)	(6, 5)	(6, 6)

Reminder of Some Class Rules

No Food or Drink in class!!

Only Exception = Water in a Sealed Bottle

Respect the room and class members
– clean up after yourself!



Bathroom breaks are meant
for **emergencies ONLY!**



Please use the restroom **between**
classes - NOT during class!



Who Wants to Be a Millionaire?

Review: Important Terms 1

1. Set
2. Element of a set
3. Roster notation/set-builder notation
4. Set equality
5. Subset
6. Empty set
7. Universal set
8. Set union

Review: Important Terms 2

9. Set intersections
10. Set complements
11. Multiplication principle
12. Permutations
13. Combinations
14. n-factorial
15. DeMorgan's Law

Review: Important Terms 3

16. Sample space
17. Event
18. Union of events
19. Intersection of events
20. Complement of an event
21. Mutually exclusive events
22. Probability of an event
23. Conditional probability
24. Independent events

Homework

- Complete Unit 1 Test Review Handout
- **Omit # 23b and #24!!**
- **STUDY FOR TEST!**
- Look over homework and quizzes!

