Unit 8: Probability

Name: KEY!

Math 2 Review Solutions

Math 2

Directions: True/False. If the statement is false, correct it to make it true.

1. The set with no elements is called the universal set. False, it is called an empty set.
2. The sample space of an experiment is the set of all possible outcomes. True.
3. Two events are complements if the events cannot both occur in the same trial of an experiment. True
4. The probability that event B occurs given that event A has already occurred is the theoretical probability. False, it is conditional probability.
5. Two events are independent events if the occurrence of one event does not affect the occurrence of the other event. True
6. A permutation is a selection of a group of objects in which order is not important. False, a combination
7. Surveying students at a high school about their favorite high school in WS/FCS is an example of a convenience sample. True.

8. You have a standard deck of cards (52 cards, 4 suits, 13 cards per suit). Let event A be the probability of drawing a black card. Let event B be the probability of drawing a diamond. Let event C be the probability of drawing a 10. Let event D be the probability of drawing a red card. Calculate the following probabilities.

a. P(B) 13/52 = 1/4	b. $P(D^c)$ = Black Cards 26/52 = 1/2	c. $P(C \cup D)$ tens + reds – red tens 4/52 + 26/52 – 2/52 = 28/52	d. $P(B \cap A)$ *Empty Set!*

9. Twenty-three students in Math II have English I, Biology, or both. Fifteen students in Math II are enrolled in Biology. Eleven students in Math II are enrolled in English I. How many of the students are in Biology and English I?

15 + 11 – 23 = 3 students have Bio and English 1

10. What is the complement of passing this test? Are passing this test and its complement mutually exclusive? Explain?

Not passing the test! Yes, they are mutually exclusive because both events can't happen at the same time (you can't pass the test *and* fail the test)

11. The principal of your school wants to find out whether there is a connection between students who do their homework on time and students who pass their math tests. He/She collected data randomly on 60 students. The results are shown below in the table.

	Passed Test	Didn't Pass Test	Total
On Time HW	42	3	45
Not on time HW	6	9	15
Total	48	12	60

   a. To the nearest percent, what is the probability that a student who didn't pass the test turned in their homework on time? 3/12 = ¼ = 25%

   b. To the nearest percent, what is the probability that a student had not on time homework and didn't pass the test? 9/60 = 15%

   c. To the nearest percent, what is the probability that a student passed the test? 48/60 = 80%

12. There are 12 boys and 11 girls in your math II class. What is the probability of randomly selecting a girl followed by a boy (without replacement)?

(11/23)(12/22) = 6/23

13. Your teacher has a "Grading Test Playlist" on his/her iPhone that consists of 8 songs. A. In how many different ways can the songs be played? B. In how many different ways can the songs be played if "23" by Miley Cyrus is the 4th song to be played?

A. 8! = 40,320 ways

B. 7! = 5,040 ways

14. A subset of Math II consists of 7 Biology students and 4 English I students. If two students are chosen at random from the subset, what is the probability that two English I students are picked?

(4/11)(3/10) = 6/55

15. Give an example of the following given events A and B. *Answers will vary.*

a. Subset
A = Ice cream Flavors
B = Mint Chocolate Chip

b. Intersection
A = {1, 2, 3, 4}
B = {4, 5, 6}
Intersection = {4}

c. Union
A = even # on dice
B = odd # on dice
Union = {all # on dice}

d. Complement
A = # on dice
B = even # on dice
B^C = odd # on dice

16. Jenna is on a shopping spree. She buys six tops, three shorts and 4 pairs of sandals. How many different outfits consisting of a top, shorts and sandals can she create from her new purchases?

(6)(3)(4) = 72 Outfits

17. What is the total number of possible 4-letter arrangements of the letters m, a, t, h, if each letter is used only once in each arrangement?

4! = 24 ways

18. There are 12 boys and 14 girls in Ms. Russell's math class. Find the number of ways Ms. Russell can select a team of 3 students from the class to work on a group project. The team is to consist of 1 girl and 2 boys.

$({}_{14}C_1)({}_{12}C_2)$

19. How many different ways are there to pick a team of 3 people from a group of 10?

${}_{10}C_3$

20. How many different ways are there to pick a President, VP and Waterboy from a group of 10?

${}_{10}P_3$

21. How many ways are there to Choose 3 desserts from a menu of 10?

${}_{10}C_3$

22. How many ways are there to list your 3 favorite desserts, in order, from a menu of 10?

${}_{10}P_3$