

HW Day 9 & 10: Unit 6 Probability Review

Show work to receive credit!!

Solve the problem.

1. Lisa has 4 skirts, 8 blouses, and 2 jackets. How many 3-piece outfits can she put together assuming any piece goes with any other?

- A) 32      B) 64      C) 14      D) 128

2. A combination lock has 20 numbers on it. How many different 3-digit lock combinations are possible if no digit can be repeated?

- A) 2280      B) 6840      C) 1140      D) 380

$$20 \cdot 19 \cdot 18$$

3. A church has 10 bells in its bell tower. Before each church service 3 bells are rung in sequence. No bell is rung more than once. How many sequences are there?

- A) 720      B) 604,800      C) 120      D) 1,209,600

4. A hamburger shop sells hamburgers with cheese, relish, lettuce, tomato, onion, mustard or ketchup. How many different hamburgers can be concocted using any 5 of the extras?

- A) 1260      B) 2520      C) 42      D) 21

$${}^7C_5$$

5. You randomly select one card from a standard 52-card deck. Then, the probability of not selecting a king,  $P(\text{not king}) =$

- A)  $1 - P(\text{king})$       B)  $1 + P(\text{king})$       C)  $P(\text{king})$       D)  $- P(\text{king})$

6. The physics department of a college has 7 male professors, 11 female professors, 16 male teaching assistants, and 8 female teaching assistants. If a person is selected at random from the group, find the probability that the selected person is a teaching assistant or a female.

- A)  $\frac{4}{7}$       B)  $\frac{9}{14}$       C)  $\frac{5}{6}$       D)  $\frac{19}{42}$

$$\frac{24}{42} + \frac{19}{42} - \frac{8}{42} = \frac{35}{42}$$

7. In a class of 50 students, 32 are Democrats, 16 are business majors, and 6 of the business majors are Democrats. If one student is randomly selected from the class, find the probability of choosing a Democrat or a business major.

- A)  $\frac{1}{5}$       B)  $\frac{24}{25}$       C)  $\frac{21}{25}$       D)  $\frac{27}{25}$

$$\frac{32}{50} + \frac{16}{50} - \frac{6}{50} = \frac{42}{50}$$

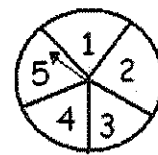
8. Use the spinner shown, find the probability that the arrow will land on an odd number. Assume that it is equally probable to land on any of the numbered spaces. If the pointer lands on the border, spin again.

A)  $\frac{2}{5}$

B)  $\frac{3}{5}$

C) 1

D) 0



$\frac{3}{5}$

9. A die is rolled. The sample space of equally likely outcomes is (1, 2, 3, 4, 5, 6). Find the probability of getting a 6.

A)  $\frac{1}{6}$

B) 1

C) 6

D) 0

10. You are dealt one card from a standard 52-card deck. Find the probability of being dealt a picture card.

A)  $\frac{3}{52}$

B)  $\frac{1}{13}$

C)  $\frac{3}{26}$

D)  $\frac{3}{13}$

$\frac{12}{52}$

11. A fair coin is tossed two times in succession. The sample space of equally likely outcomes is (HH, HT, TH, TT). Find the probability of getting the same outcome on each toss.

A)  $\frac{1}{4}$

B)  $\frac{1}{2}$

C)  $\frac{3}{4}$

D) 1

12. You randomly select one card from a standard 52-card deck. Find the probability of selecting an ace or a 9.

A)  $\frac{2}{13}$

B)  $\frac{13}{52}$

C)  $\frac{5}{13}$

D) 10

$\frac{8}{52}$

$$\frac{4}{52} + \frac{4}{52} = \frac{8}{52} = \frac{2}{13}$$

13. A spinner is used for which it is equally probable that the pointer will land on any one of six regions. Three of the regions are colored red, two are green, and one is yellow. If the pointer is spun three times, find the probability it will land on green every time.

A)  $\frac{2}{27}$

B)  $\frac{1}{9}$

C)  $\frac{1}{18}$

D)  $\frac{1}{27}$

$$\frac{2}{6} \cdot \frac{2}{6} \cdot \frac{2}{6} = \frac{8}{216}$$

14. You are dealt one card from a standard 52-card deck. Then the card is replaced in the deck, the deck is shuffled, and you draw again. Find the probability of getting a picture card the first time and a club the second time.

A)  $\frac{3}{13}$

B)  $\frac{1}{13}$

C)  $\frac{3}{52}$

D)  $\frac{1}{4}$

$$\frac{12}{52} \cdot \frac{13}{52} = \frac{156}{2704} = \frac{3}{52}$$

15. Two dice are rolled. The numbers are multiplied. What is the probability of getting a 12?

A)  $\frac{1}{9}$

B)  $\frac{1}{12}$

C)  $\frac{1}{36}$

D)  $\frac{1}{4}$

$\frac{4}{36}$

HW Day 9 & 10 (cont.): Probability Test Review

Show work for credit!!

1. Bag A contains 12 yellow m&m's and 8 green m&m's. Bag B contains 9 blue m&m's and 11 orange m&m's. Find the probability of selecting one green m&m from Bag A and one blue m&m from Bag B in one draw from each bag.

$$\frac{8}{20} \cdot \frac{9}{20} = \frac{72}{400}$$

3. A new Wednesday lunch special at a local fast food restaurant consists of a chicken sandwich, a choice of bottled water, milk or tea and a choice of baked potato or French fries. How many different selections of these items are possible?

5. Find the number of ways the letters in the word *friend* can be arranged?

2. Find the probability of randomly selecting a brown m&m in one draw from a candy dish containing 18 brown m&m's, 7 red m&m's, and 15 orange m&m's.

$$\frac{18}{40} = \frac{9}{20}$$

4. Two students, one from each of two biology classes are to be randomly selected from to go take a test on anatomy at the local community college. Jill is in a class of 28 students and Emily is in another class of 32 students. Find the probability that both Jill and Emily will be selected?

$$\frac{1}{28} \cdot \frac{1}{32}$$

6. How many different ways can you purchase 4 different kinds of soda from a selection of 9 different sodas?

$${}^9C_4 = 126$$

7. Amazon.com Marketplace conducted a survey of 125 customers its biggest seller (1) and 125 customers of its second biggest seller (2). The customers were asked whether their orders arrived early, on-time, late or not at all. The responses are given in the table below.

Group	1	2	Total
Early	5	26	31
On - Time	113	88	201
Late	5	10	15
Never	2	1	3
Total	125	125	250

a. Find the probability that a randomly selected respondent to the survey received their order early or not at all.

b. Find the probability that a randomly selected respondent to the survey ordered from seller 2 or received their order on time.

c. Find the probability that a randomly selected respondent to the survey ordered from seller 2, given that their order arrived on time.

d. If a respondent ordered from seller 1, how likely is it that the respondent received their order early?

8. After interviewing your friends, you find that 75% of them like chocolate ice cream, and that 30% like chocolate and strawberry. What percent of those who like chocolate also like strawberry?

$$P(S|C) = \frac{.30}{.75} = .4 \rightarrow 40\%$$

9. In a certain school, 65% of the boys play baseball and 28% of the boys play baseball and football. What percent of those that play baseball also play football?

$$P(A|B) = \frac{P(A \cap B)}{P(B)}$$

10. A student conducted a survey about coffee drinking preferences among students. Of the 50 students, 30 were aged 19-23. From those who said they enjoyed coffee, 4 were 14-18 years old. *24 students do not enjoy coffee.*

	Likes Coffee	Doesn't Like Coffee	Total
Age 14 - 18	4	16	20
Age 19 - 23	22	8	30
Total	26	24	50

a. Complete the two-way table.

b. Find  $P(\text{like coffee})$

$$\frac{26}{50} = \frac{13}{25}$$

d. Find the probability that someone she surveyed was 14-18 years old.

$$\frac{20}{50} = \frac{2}{5}$$

c. Find  $P(\text{age 14-18} | \text{not like coffee})$

$$\frac{16}{24} = \frac{2}{3}$$

e. Find probability of a student liking coffee given they are age 19 - 23.

$$\frac{22}{30} = \frac{11}{15}$$

11. Janie has a bag with 9 blue candies and 5 red candies. She selects a candy randomly from the bag, does not replace it then picks again randomly. Blue candy is Janie's favorite, so she hopes to select them.

a. What is the probability that Janie selects 2 of her favorite candy?

b. What is the probability that she gets at least 1 of her favorite candy?

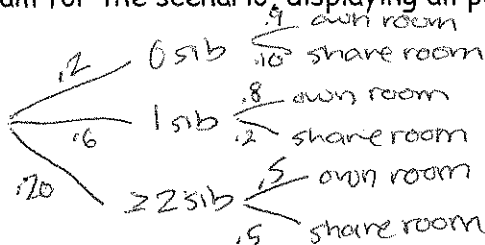
c. Find  $P(1 \text{ of each color})$

d. Find  $P(\text{both red } \otimes)$

12. A student conducted a survey at school and found the following:

- Of the respondents, 60% have 1 sibling and 20% have 2 or more siblings
- Of the respondents with 0 siblings, 90% have their own room
- Of the respondents with 1 sibling, 20% do not have their own room
- Of the respondents with 2 or more siblings, 50% have their own room

a. Create a tree diagram for the scenario, displaying all possibilities and percentages



b. What is the probability that a randomly selected student from this school has 1 sibling and has their own room?

$(.6)(.8) = 48\%$   
 $.4800$

c. What is the probability that a randomly selected student has their own room?

$P(0 \text{ sib} + \text{own rm}) + P(1 \text{ sib} + \text{own})$   
 $+ P(\geq 2 \text{ sib} + \text{own})$   
 $(.2)(.9) + (.6)(.8) + (.2)(.5) = .76$

d. Find  $P(\text{own room} | 2 \text{ or more siblings})$

$.50$   
 $50\%$

~~$.4800$~~

e. Find  $P(\text{share room} | 1 \text{ sibling})$

$.20$   
 $20\%$

look at middle branch of tree

13. In a certain school the students in Common Core Math 2 completed a survey about cats and dogs.

They found that 47% of the children in a school have a dog. Of those with no dog, 30% have a cat. 16% of those with a dog also have a cat.

a. Create a tree diagram for the scenario, displaying all possibilities and percentages

b. What is the probability that a randomly selected student from this school has a dog and a cat?

c. What is the probability that a randomly selected student has either no dog or no cat?

d. Find  $P(\text{dog} | \text{cat})$

$\frac{P(D \cap C)}{P(D \cap C) + P(ND \cap C)}$

e. Find  $P(\text{no cat} | \text{no dog})$

$\frac{P(\bar{C} | \bar{D})}{P(\bar{D})}$   
 $\frac{P(\bar{C} \cap \bar{D})}{P(\bar{D})}$