Practice Test 2.8 (Probability and Odds) Name Key

1. You buy 6 raffle tickets. What is the probability that you will win if 180 tickets were sold?

2. Use the following information to answer the following questions. The table shows the favorite subjects of those in the senior class.

Subject	English	Social Studies	Science	Math	Foreign Language	Physical Education	No Preference
Number	35	45	55	40	25	15	30

a. How many total seniors were surveyed? 245

b. What is the probability that a student said Physical Education? $\frac{15}{245} = \frac{3}{49}$

c. What is the probability that a student did not say Social Studies? $\frac{200}{245} = \frac{40}{49}$

4. Use the following information about the number of female voters in 1971.

Age	Total Population	Number registered	*Number not registered*
21 to 24 years old	7,200,000	4,000,000	3,200,000

a. Find the probability that a female from the 21-24 age group is not a registered voter.

$\frac{3,200,000}{7,200,000} = \frac{4}{9}$

5. In the word MISSISSIPPI, what is the probability of choosing an I? $\frac{4}{11}$

6. Using the fact that there are a total of 36 possible combinations for rolling two dice, answer the following questions.

   a. What is the probability of rolling 2 dice and getting a product greater than 10? $\frac{17}{36}$

   b. What is the probability of rolling 2 dice and getting a sum greater than 5? $\frac{26}{36} = \frac{13}{18}$

   c. What is the probability of rolling 2 dice and getting a quotient less than 4? Bigger/Smaller $\frac{30}{36} = \frac{5}{6}$

   d. What is the probability of rolling 2 dice and getting a difference less than 2? Bigger - Smaller $\frac{16}{36} = \frac{4}{9}$

10. Using the fact that there are 52 playing cards in a deck of cards answer the following questions.

   a. What is the probability of drawing a 5 from a deck of 52 cards? $\frac{5}{52}$

   b. What is the probability of drawing a red 5 from a deck of 52 cards? $\frac{2}{52} = \frac{1}{26}$

   c. What is the probability of drawing a black 5 from a deck of 52 cards? $\frac{2}{52} = \frac{1}{26}$

   d. What is the probability of drawing a card smaller than 5 from a deck of 52 cards? Ace High Card $\frac{12}{52} = \frac{3}{13}$ Ace low Card $\frac{16}{52} = \frac{4}{13}$

   e. What is the probability of drawing a red card smaller than 5 from a deck of 52 cards? Ace High Card $\frac{6}{52} = \frac{3}{26}$ Ace low Card $\frac{8}{52} = \frac{2}{13}$

   f. What is the probability of drawing a black card smaller than 5 from a deck of 52 cards? Ace High Card $\frac{6}{52} = \frac{2}{26}$ Ace low Card $\frac{8}{52} = \frac{2}{13}$

Directions: Find each probability assuming you are drawing one card, **replacing it**, and then drawing another card.

1. What is the probability of drawing a red card on the first draw and a face card on the second card from a deck of cards? $\frac{26}{52} \cdot \frac{12}{52} = \frac{312}{2704} = \frac{3}{26}$

2. What is the probability of drawing a black card on the first draw and a non face card on the second draw from a deck of cards?
$\frac{26}{52} \cdot \frac{40}{52} = \frac{1040}{2704} = \frac{5}{13}$

3. What is the probability of drawing a heart on the first draw and a face card on the second draw from a deck of cards?
$\frac{13}{52} \cdot \frac{12}{52} = \frac{156}{2704} = \frac{3}{52}$

4. What is the probability of drawing a club on the first draw and a non face card on the second draw from a deck of cards?
$\frac{13}{52} \cdot \frac{40}{52} = \frac{520}{2704} = \frac{5}{26}$

Directions: Find each probability assuming you are drawing one card, **not replacing it**, and then drawing another card.

1. What is the probability of drawing a red king on the first draw and a face card on the second card from a deck of cards? $\frac{2}{52} \cdot \frac{11}{51} = \frac{22}{2652} = \frac{11}{1326}$

2. What is the probability of drawing a black 5 on the first draw and a non face card on the second draw from a deck of cards? $\frac{2}{52} \cdot \frac{39}{51} = \frac{78}{2652} = \frac{1}{34}$

3. What is the probability of drawing a Queen of hearts on the first draw and a face card on the second draw from a deck of cards? $\frac{1}{52} \cdot \frac{11}{51} = \frac{11}{2652}$

4. What is the probability of drawing a Jack of clubs on the first draw and a non face card on the second draw from a deck of cards? $\frac{1}{52} \cdot \frac{40}{51} = \frac{40}{2652} = \frac{10}{663}$

1) You survey friends about the type of party they enjoy most.

Party Type	Gender: Male	Female	Total
Bowling	6	2	8
Skating	3	11	14
Dancing	1	3	4
Total	10	16	26

a. P(Male) $\frac{10}{26} = \frac{5}{13}$

b. P(Skating) $\frac{14}{26} = \frac{7}{13}$

c. P(Female and Bowling) $\frac{2}{26} = \frac{1}{13}$

d. P(Male or Dancing) $P(Male) + P(Dancing) - P(Male \text{ and } Dancing)$

$\frac{10}{26} + \frac{4}{26} - \frac{1}{26} = \frac{13}{26} = \frac{1}{2}$

e. $P(Male|Bowling)$ $\frac{6}{8} \rightarrow \frac{3}{4}$

f. Are female and dancing mutally exclusive? Explain. No. There are 3 Females that Dance

g. Are males and chosing to bowl independent events? Explain.

No. $P(Males) \neq P(Male|Bowling)$

$\frac{5}{13} \neq \frac{3}{4}$ Probability changes

1) Fifty students in the 8th grade class were asked what kind of ice-cream they like (vanilla or chocolate) and what kind of toppings they like (sprinkles, m & m's, or nothing). Identify any trends in the data.

Topping	Sprinkles	m & m's	Nothing	Total
Vanilla	9	8	13	30
Chocolate	7	9	4	20
Total	16	17	17	50

a. P(Vanilla) = $\frac{30}{50} = \frac{3}{5}$

b. P(Nothing) $\frac{17}{50}$

c. P(Chocolate and M&M's) = $\frac{9}{50}$

d. P(Vanilla or Sprinkles)

$\frac{30}{50} + \frac{16}{50} - \frac{9}{50}$

$\frac{37}{50}$

e. $P(\sim Chocolate)$ $\frac{30}{50} = \frac{3}{5}$

f. $P(Chocolate|Sprinkles)$ $\frac{7}{16}$

g. $P(Nothing|Vanilla)$ $\frac{13}{30}$

h. $P(Chocolate|m\&m's)$ $\frac{9}{17}$

5) A survey of randomly selected Sagamore students explored the relationship between gender and video game play. Which is not a reasonable interpretation of the data?

	Boys	Girls	Total
Play Daily	45	12	57
Do Not Play Daily	5	38	43
Total	50	50	100

a. P(Did Not Play Daily) $\frac{43}{100}$

b. P(Boys) $\frac{50}{100} = \frac{1}{2}$

c. P(Girls and Did Play Daily) $= \frac{38}{100} = \frac{19}{50}$

d. P(Boys or Did Play Daily) $\frac{50}{100} + \frac{43}{100} - \frac{5}{100} = \frac{88}{100} = \frac{22}{25}$

e. $P(Did\ not\ Play\ Daily|Boys)$ $= \frac{5}{50} = \frac{1}{10}$

f. $P(Girls|Did\ Not\ Play\ Daily)$ $\frac{38}{43}$

g. Are the events of boys and played video games daily mutually exclusive? Explain. No. 45 boys said they played video games daily.

h. Are the events boys and did not play daily independent? Explain.

$P(Boy) = P(Boy|Did\ not\ play)$

$\frac{1}{2} \neq \frac{5}{43}$ No Not independent.

If 23% of adults sing in the shower, what it the probability that if you select 3 adults at random, All 3 will sing in the shower?

$(.23)(.23)(.23) = .012$

None of the 3 sing in the shower?

$(.77)(.77)(.77) = .456$

2 of the 3 sing in the shower.

$(.23)(.23)(.77) = .0407$

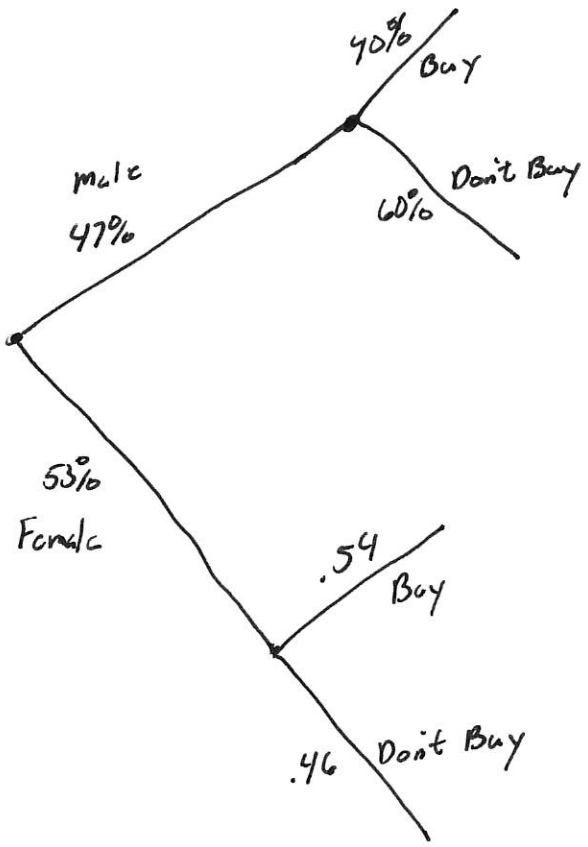
If 65% of Americans put cheese on a hamburger, what is the probability that Stephen Hawking does put cheese and a hamburger and Bill Gates does not?

$(.65)(.35) = .2275$

If 34% of Americans watch the NBA playoffs, what is the probability that Mr. Powell does, Mr. Selden doesn't, and Taylor Swift doesn't watch the NBA playoffs?

$(.34)(.66)(.66) = .148$

A company is focus testing a new type of fruit drink. The focus groups is 47% male. Of the males in the group, 40% said they would by the fruit drink, and of the females, 54% said they would by the fruit drink. Find the probability that a randomly selected person would buy the fruit drink.



Male Buy Female Buy

$(.47)(.40) + (.53)(.54)$

$.4742$