Unit 2: w.s. #1 Name Key (2016) Period

1. Match the probabilities with each statement.

Statements	Probabilities
(a) This event is certain. It will always occur. 1	0
(b) This event is impossible. It can never occur.	0.01
(c) This event will occur more often than not. .6	0.3
(d) This event is very likely. It will occur almost every time.	0.6
(e) This even is very unlikely, but will occur very rarely. .01	0.99
	1

2. Choose a student at random from all who took statistics in recent years. The probabilities are:

Grade:	A	B	C	D	F
Probability:	20%	30%	30%	10%	?

(a) What must be the probability of getting an F? 10%

(b) What is the probability of getting a C **or** better?

(c) What is the probability of getting an A **or** an F? 30%

(d) What is the probability of **not** getting an A?

3. When drawing a single card from a standard deck of 52 cards:

(a) What must be the probability of getting a Jack? 4/52

(b) What is the probability of getting any face card (Jack **or** Queen **or** King)?

(c) What is the probability of getting a spade? 13/52

(d) What is the probability of getting any black card (Spades or Clubs)?

(e) What is the probability of **not** an Ace?

4. A teacher is randomly selected.

	Science	Math	English	Phy. Ed.	Social Studies
Bachelor's	5	4	7	4	11
Master's	6	9	4	3	3
PhD	2	3	1	0	2

a) Find the probability that the teacher selected has a Master's degree. a. $\frac{25}{64}$

b) Find the probability that the teacher is a Math teacher **or** has their PhD. b. _____

c) Find the probability that the teacher is an English **or** Social Studies teacher. c. $\frac{28}{64}$

d) Find the probability that the teacher has a Bachelor's degree **or** teaches Science. d. _____

e) Find the probability that the teacher has a Master's degree **or** PhD. e. $\frac{33}{64}$

f) Find the probability that the teacher has a PhD **or** teaches English. f. _____

g) Find the probability that the teacher selected does **not** teach Math. g. $\frac{48}{64}$

5. Anoka students are surveyed about favorite radio station. Here are the results:

	KDWB	93X	K102	B96	The Current
Freshman	115	59	36	42	9
Sophomore	98	47	40	32	16
Junior	102	55	43	15	22
Senior	79	62	39	28	37

a) Find the probability that the student favors KDWB **or** K102. a. $\frac{552}{976}$

b) Find the probability that the student is a freshman or sophomore. b. _____

c) Find the probability that the student is a junior **or** favors The Current. c. $\frac{299}{976}$

d) Find the probability that the student favors 93X **or** is a senior. d. _____

e) Find the probability that the student is a sophomore **or** favors B96. e. $\frac{318}{976}$

f) Find the probability that the student is a junior **or** senior. f. _____

Unit 2: w.s. #2

Name Key (2016)

Period

1. A vehicle is randomly selected from a parking lot.

	Blue	Red	White	Black	Silver
Car	15	4	7	12	11
Truck	10	7	4	8	3
Van	2	1	5	7	2

a) Find the probability that the vehicle is a car. a. 49/98

b) Find the probability that the vehicle is a white car. b. _____

c) Find the probability that the vehicle is a car **or** silver. c. 54/98

d) Find the probability that the vehicle is a red **or** silver. d. _____

e) Find the probability that the vehicle is a black **or** a truck. e. 51/98

f) Find the probability that the vehicle is a car **given** that it is silver. f. _____

g) Find the probability that the vehicle is a blue **given** that it is a van. g. 2/17

h) Find the probability that the vehicle is a truck **given** that it is white. h. _____

2. A college Chemistry class has a student enrollment as follows.

	Sophomore	Junior	Senior
Female	4	17	15
Male	2	14	13

a) Find the probability that the person is a junior. a. 31/65

b) Find the probability that the person is a sophomore **or** a female. b. _____

c) Find the probability that the person is a male **or** a junior. c. 46/65

d) Find the probability that the person is a male **given** that he is a senior. d. _____

e) Find the probability that the person is a female junior. e. 17/65

f) Find the probability that the person is a sophomore male. f. _____

g) Find the probability that the person is a junior **given** that she is a female. g. 17/36

h) Find the probability that the person is a senior **given** that he is a male. h. _____

3. A group of AHS females were surveyed about their prom plans.

	going with friends	going with date	not going
Sophomore	2	6	24
Junior	18	13	19
Senior	22	25	15

a) Find the probability that the student is going with friends **and** is a senior. a. $\frac{22}{144}$

b) Find the probability that the student is going with a date **or** a junior. b. _____

c) Find the probability that the student is **not** going **or** a sophomore. c. $\frac{66}{144}$

d) Find the probability that the student is going with a date **given** she is a senior. d. _____

e) Find the probability that the student is a senior **given** she is going with a date. e. $\frac{25}{44}$

f) Find the probability that the student is going with a date **and** is a sophomore. f. _____

g) Find the probability that the student is a sophomore **and** is a senior. g. 0

h) Find the probability that the student is going with friends **or** a sophomore. h. _____

i) Find the probability that the student is **not** going **given** she is a junior. i. $\frac{19}{50}$

Unit 2: w.s. #3

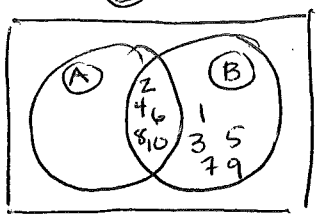
Name Key (2016)

Period

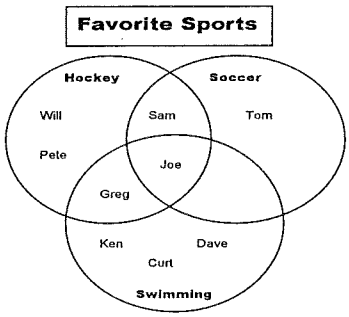
1. Draw a Venn diagram and then find the **intersection** of the sets.

{2, 4, 6, 8, 10} ∩ {1 ,2 ,3 ,4 ,5 ,6 ,7 ,8 , 9 ,10} = {2, 4, 6, 8, 10}

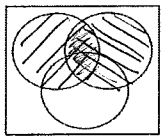
(A) (B)



2. Use the Venn diagram given the answer the following questions.

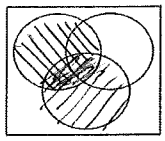


a. Soccer∩Hockey =



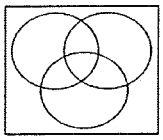
{Sam, Joe}

c. Swimming∩Hockey =

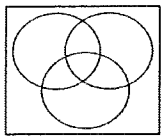


{Greg, Joe}

b. Swimming∩Soccer =



d. Swimming∩Soccer∩Hockey =

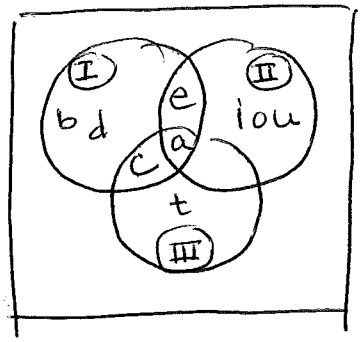


3. Draw a Venn diagram and then find the **union** of the sets.

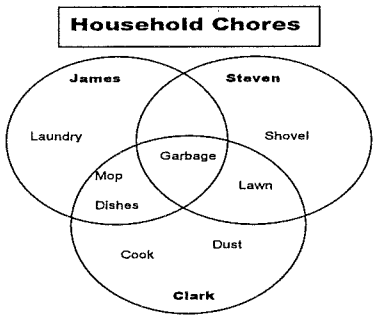
{a, b, c, d, e} ∪ {a, e, i, o, u} ∪ {c, a, t}

(I) (II) (III)

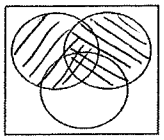
= {a, b, c, d, e, i, o, u, t}



4. Use the Venn diagram given the answer the following questions.

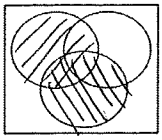


a. Steven∪James =



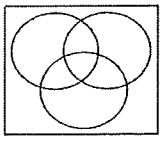
Laundry, Mop, Dishes, Garbage, Shovel, Lawn

c. James∪Clark =

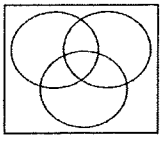


Laundry, Mop, Dishes, Garbage, Lawn, Cook, Dust

b. Steven∪Clark =

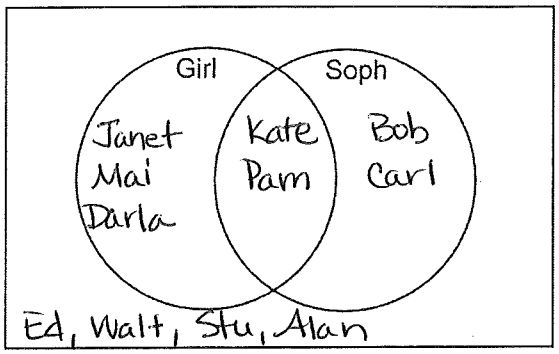


d. James∪Clark∪Steven =

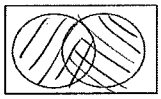


5. Place the names in the appropriate location in the Venn diagram and then answer the questions that follow.

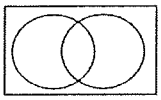
Bob: Sophomore
Stu: Junior
Alan: Junior
Walt: Freshman
Carl: Sophomore
Ed: Senior
Janet: Junior
Mai: Junior
Kate: Sophomore
Darla: Senior
Pam: Sophomore



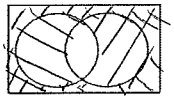
{Girl} ∪ {Sophomore} = J, M, D, K, P, B, C



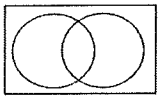
{not Girl} ∪ {Sophomore} =



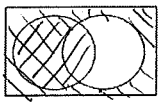
{not Girl} ∪ {not Sophomore} = J, M, D, B, C, E, W, S, A



{Girl} ∩ {Sophomore} =

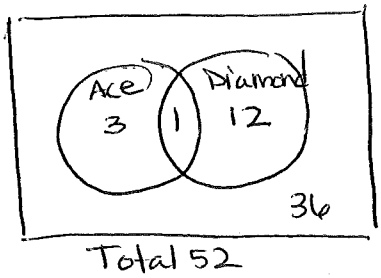


{Girl} ∩ {not Sophomore} = J, M, D



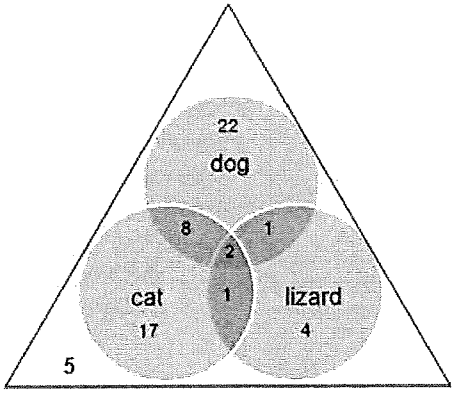
6. Make a Venn diagram for drawing a single card. Let A= Aces and B=diamonds.

- P(diamond)= 13/52
- P(Ace **or** diamond)=
- P(**not** diamond)= 39/52
- P(**not** Ace **and not** diamond)=
- P(diamond **and** Ace)= 1/52
- P(Ace **and not** diamond)=



7. Sixty individuals were survey about what type of pet they own.

- P(dog **or** lizard)= 38/60
- P(cat **and** dog)=
- P(cat **or** dog **or** lizard)= 55/60
- P(owns cat **and** dog **and** lizard)=
- P(**not** cat **and not** dog **and not** lizard)= 5/60



Unit 2: w.s. #4

Name Key (2016)

Period

1. The following are probability models for the outcomes when a 6-sided die is rolled. **Describe** why each model *is* or *is not legitimate*.

(a) Not Legitimate

Outcome	1	2	3	4	5	6
Probability	.30	.15	0	.25	-.05	.40

not $0 \le P(E) \le 1$

(b)

Outcome	1	2	3	4	5	6
Probability	.10	.15	.15	.20	.25	.03

(c) Legitimate

Outcome	1	2	3	4	5	6
Probability	.25	.05	.35	.12	.13	.10

- all $P(E)$: $0 \le P(E) \le 1$
- sum of probs = 1

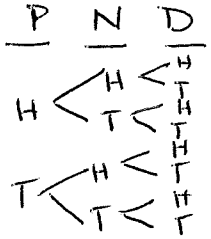
(d)

Outcome	1	2	3	4	5	6
Probability	.05	1.05	.5	.25	.10	.60

2. You flip a penny, a nickel, and a dime and record if each lands heads or tails.

(a) Make a probability model for one toss of the three coins.

outcomes	HHH	HHT	HTH	HTT	THH	THT	TTH	TTT
probability	1/8	1/8	1/8	1/8	1/8	1/8	1/8	



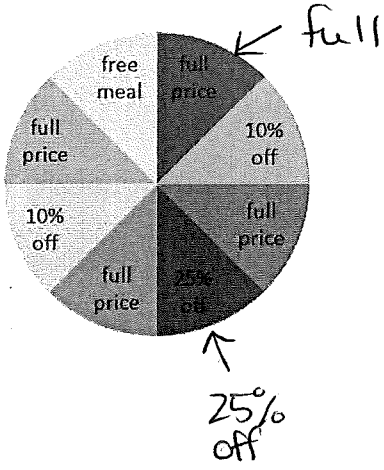
(b) What is the probability that they land penny=tails, nickel=heads, and dime=tails? 1/8

(c) What is the probability that they land with all tails?

(d) What is the probability that **at most** one coin lands heads? 4/8

(e) What is the probability that **at least** one coin lands tails?

3. The Snack Shack has a spinner you can spin when you get your bill. The spinner tells you what part of your bill you must pay.



(a) Make a probability model for one spin.

outcomes	free	full	10% off	25% off
probability	1/8	4/8	2/8	1/8

(b) What is the probability that you will not have to pay full price?

(c) What is the probability that you will get 10% or 25% off?

(d) What is the probability that you will get at least 25% off?

4. Refer to the probability model for rolling **two** 6-sided dice in your notes to find each probability.

(a) P(sum of 7) $\boxed{6/36}$

(b) P(sum of 7 **or** 11)

(c) P(sum of 12) $\boxed{1/36}$

(d) P(sum of 2 **or** 12)

(e) P(sum of 3) $\boxed{2/36}$

(f) P(sum of **less than** 7)

(g) P(sum of 9) $\boxed{4/36}$

(h) P(sum of 6, 7, **or** 8)

5. A tetrahedral (4-sided) die has faces labeled with 1, 2, 3, and 4 spots.
(a) Make a probability model for rolling **one** such die.

outcomes	1	2	3	4
probs.	1/4	1/4	1/4	1/4

(b) What is the probability of rolling a 2 **or** 3? $\boxed{2/4}$

(c) What is the probability of rolling **less than** a 4?

(d) What is the probability of rolling **at least** a 3? $\boxed{2/4}$

(e) What is the probability of **not** rolling a 1?

6. Now we are rolling **two** tetrahedral (4-sided) dice.
(a) Make a probability model for rolling two tetrahedral dice.

(b) What is the probability of rolling a sum of 5? $\boxed{4/16}$

(c) What is the probability of rolling a sum of 7 **or** 8?

(d) What is the probability of rolling a sum that is **not** 2? $\boxed{15/16}$

(e) What is the probability of rolling a sum of 12?

(f) What is the probability of rolling a sum **less than** 6? $\boxed{10/16}$

(g) What is the probability of rolling a sum of **at least** 6?

Unit 2: w.s. #5

Name Key (2016)

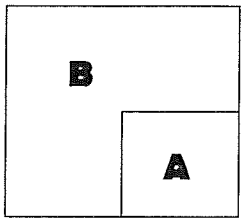
Period

For each problem, make a probability model and find the expected value.

1. Sarah throws a dart at the dartboard pictured here.
   If it lands in A, she wins $12. Otherwise, she loses $3.

outcome	A: $12	B: −$3
prob	1/4	3/4

$E(x) = \$.75/\text{game}$



2. Rick throws two darts at the same dartboard as Sarah.
   If they both land in A, she wins $50. If they both land in B, she loses $2.
   Otherwise, she breaks even.

3. A deck of cards contains 52 cards of which 4 are aces. You are offered the following wager: Draw one card at random from the deck. You win $10 if the card is an ace. Otherwise, you lose $1.

outcome	Ace: $10	Not Ace: −$1
prob	4/52	48/52

$E(x) = -\$.15/\text{game}$

4. A deck of cards contain 13 hearts. Here is another wager: Draw one card at random. If the card is a heart, you win $2. Otherwise, you lose $1.

5. Melinda draws one card from a standard deck. If it is a diamond, she wins $50. Otherwise, she loses $10.

outcome	diamond: $50	not diamond: −$10
prob	13/52	39/52

$E(x) = \$1.5/\text{game}$

6. A study conducted by a television station showed the number of televisions per household and the corresponding probabilities. Find the average number of TV sets per household.

# of TVs	1	2	3	4	5
Probability	.12	.21	.22	.35	.10

7. Amy tosses 3 coins. If they all land heads, she wins $60. Otherwise, she loses $8. (hint: make a tree diagram to help you list the outcomes for tossing 3 coins)

outcomes	HHH	HHT	HTH	HTT	THH	THT	TTH	TTT
	$60	−$8	−$8	−$8	−$8	−$8	−$8	−$8
prob.	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8

$E(x) = -\$.50$/game

or

outcomes	HHH	not HHH
prob	$60	−$8
	1/8	7/8

8. Three coins are tossed. If they land with **at least** 2 tails, Lela wins $30. Otherwise she loses $5.

9. Suppose you play a game with a biased coin. You play each game by tossing the coin once. P(heads)=2/3 and P(tails) = 1/3. If you toss a head, you pay $6. If you toss a tail, you win $10.

outcome	−$6	$10
prob.	2/3	1/3

$E(x) = -\$.67$/game

10. Ray draws a card randomly from a deck, and Bob gives him the number of dollars indicated by the rank (Ace $1, Two=$2,...,Ten=$10, and face cards=$10).

Unit 2: w.s. #6 Name Key (2016)

Period_____

1. Cody pays $10 to draw one card from a standard deck. If it is an Ace, he wins $100. Find the expected value.

outcome	Ace $100	Not Ace $0
prob	4/52	48/52

$E(x) = -\$2.31/\text{game}$

2. A cash prize of $2500 is to be awarded by the Community Ambulance Assn. If 3000 tickets are sold at $2 each, find the expected value.

3. A box contains ten $1 bills, five $2 bills, three $5 bills, one $10 bill, and one $100 bill. A person is charged $20 to select one bill find the expected value.

outcome	$1	$2	$5	$10	$100
prob.	10/20	5/20	3/20	1/20	1/20

$E(x) = -\$12.75/\text{game}$

4. If a person rolls doubles when he tosses two dice, he wins $5. If the game is to be fair, how much should the person pay to play the game?

5. If a player rolls two dice and gets a sum of 2 or 12 she wins $20. If the person gets a sum of 7 she wins $5. The cost to play the game is $3. Find the long term average for this game.

outcome	2 or 12 $20	7 $5	other $0
prob	2/36	6/36	28/36

$E(x) = -\$1.06/\text{game}$

6. A lottery offers one $1000 prize, one $500 prize and five $100 prizes. Two thousand tickets are sold at $3 each. Find the expected value if a person buys one ticket.

7. Ms. Boo charged her students $5 each to take the "Minnesota Quiz". If they guessed all four true/false questions correctly, they would win $20. Find the expected value.

$2 \cdot 2 \cdot 2 \cdot 2 = 16$ outcomes

outcome	$20	$0
prob	1/16	15/16

$E(x) = -\$3.75/\text{game}$

8. One thousand tickets are sold at $1 each for a color television valued at $350. Find the value of the raffle.

9. Eight hundred raffle tickets are sold at $1 each. There is one $100,one $50, one $25, and one $10. Find the average per person in the long run.

outcome	$100	$50	$25	$10	$0
prob.	$\frac{1}{800}$	$\frac{1}{800}$	$\frac{1}{800}$	$\frac{1}{800}$	$\frac{796}{800}$

$E(x) = -\$.77/\text{game}$

10. If a person, aged 60 buys a $10,000 life insurance policy at a cost of $600 and has a probability of .972 of living to age 61, find the expected value of the policy.

11. Suppose you play a game of chance in which you choose 5 numbers from 0, 1, 2, 3, 4, 5, 6, 7, 8, 9. You may choose a number more than once. You pay $2 to play and could win $100,000 if you match all 5 numbers in order. In the long term, what is your expected profit of playing the game?

outcome	$100,000	$0
prob	$\frac{1}{100,000}$	$\frac{99,999}{100,000}$

$E(x) = -\$1/\text{game}$

outcomes $= 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10$

$= 100,000$

Unit 2: w.s. #7

Name Key (2016) Period

1. Determine whether each of the following situations involve independent events or not.

a) Event one=a red marble is pulled from a bag of 5 red and 5 white, Event two=a 2nd red marble is pulled from same bag. Dependent

b) Event one=a red marble is pulled from a bag of 5 red and 5 white, Event two=a 2nd red marble is pulled from same bag after the 1st red marble is returned to the bag.

c) Event one= a spinner lands on a blue space, Event two = the spinner lands on a red space.

Independent

d) Event one= a person in the drive thru orders a Big Mac, Event two = the next person orders a Big Mac as well.

e) Event one=a mom has blond hair, Event two= the daughter has blond hair

Dependent

f)Event one=1st card drawn from a deck is a Jack, Event two=2nd card drawn is a Queen.

g) Event one= 1st card drawn from a deck is a Nine, Event two=the 9 is replaced and 2nd card drawn is a Two.

Independent

2. An opinion poll selects adult Americans at random and asks, "Which political party do you think is more concerned with health care?" Assign digits to simulate the response of one person in each of the following situations.

a) 50% choose Democratic and 50% choose Republican.

00–49	50–99

b) 60% choose Democratic and 40% choose Republican.

c) 40% choose Democratic, 40% choose Republican, and 20% undecided.

00–39	40–79	80–99

d) 53% choose Democratic and 47% choose Republican.

3. Data is gathered from a past baseball season. Assign digits to simulate 1 at bat in each of the following situations.

a) 35% get a hit and 65% are out.

00–34	35–99

b) 24% get a hit and 76% are out.

c) 10% walk, 20% get a hit and 70% are out.

00–09	10–29	30–99

d) 15% walk, 25% hit into an out, 30% strike out, and 30% get a hit.

4. Suppose 80% of a schools students favor abolish final exams. You ask 10 students chosen at random.

a) Make a probability model for asking students this question.

outcomes	abolish	don't abolish
prob	80%	20%
digits	00-79	80-99

b) Assign digits to represent "yes" and "no". Add them to your probability model.

c) Simulate 5 repetitions starting at line 115 of Table A.

61	04	17	76	84	94	32	22	47	69	8/10
73	69	81	45	26	31	89	33	25	92	8/10
14	45	92	60	56	31	42	48	03	71	9/10
65	10	36	22	53	50	49	06	11	81	9/10
38	16	79	85	32	62	18	37	06	32	9/10

d) Based on your simulation results estimate of the probability that 9 out of 10 favor abolishing final exams?

P(9 out of 10 abolish) = 3/5

5. A recent opinion poll showed that about 75% of Americans would donate their organs upon death.

a) Make a probability model for asking students this question.

b) Assign digits to represent "would donate" and "would not donate". Add them to your probability model.

c) Simulate 5 repetitions of asking 10 people starting at line 103 of Table A.

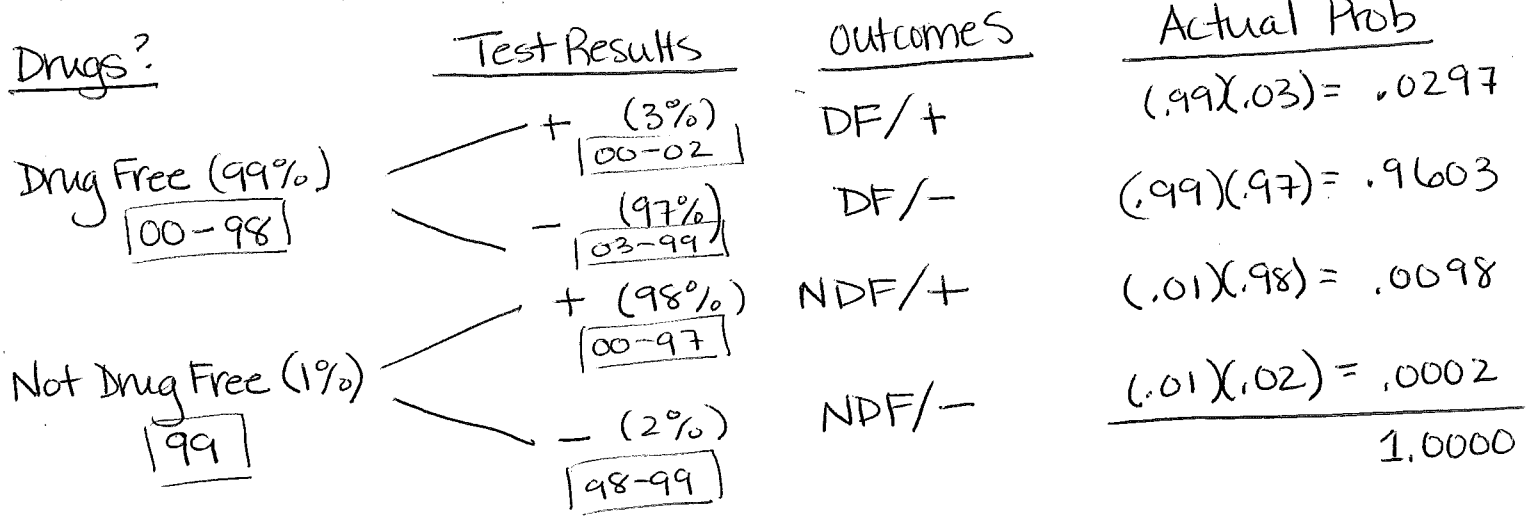
d) Based on your simulation results estimate of the probability that **at least** 7 out of 10 will donate their organs?

Unit 2: w.s. #8

Name Key (2016) Period

1. Drug testing is not 100% accurate. A certain drug test publishes these results:
   - *We know that 99% of this population are drug free.*
   - *The test gives a "positive" reading to those with drugs in their system 98% of the time.*
   - *The test gives a "positive" reading to those with NO drugs in their system 3% of the time.*

a). Create a tree diagram to illustrate this situation.



b) Assign digits to simulate the drug testing results (display these in your tree diagram).

c) Use line 102 in Table A to simulate 10 drug tests.

random numbers	73/67	64/71	50/99	40/00	19/27	27/75	44/26	48/82	42/53	62/90
outcome	DF/−	DF/−	DF/−	DF/+	DF/−	DF/−	DF/−	DF/−	DF/−	DF/−

d) Using your results, find the probability that the test gives a "false positive". = DF/+ $\frac{1}{10}$

e) Using your results, find the probability that the test gives a "false negative".
= NDF/− → $\frac{0}{10}$

f) Using your results, find the probability that the test is accurate.
= DF/− or NDF/+ → $\frac{9}{10}$

g) Calculate the actual probabilities for all the outcomes.
↓ added to tree diagram

2. Unfortunately, you have a very serious heart disease and need a heart transplant. Your doctor is asking you to make a decision about your future treatment and gives you the following important information:

- *Of those who have a heart transplant, 80% survive.*
- *If you survive the transplant operation, there is a 70% success rate. The other 30% will need to have a second transplant.*
- *The chances of surviving at least 10 years for those who had one transplant is 60% and 50% for those who needed two transplant operations.*

a) Create a tree diagram to illustrate this situation.

b) Assign digits to simulate your options for treatment of your heart disease (display these in your tree diagram).

c) Use line 111 in Table A to simulate 10 trials.

random numbers										
outcome										

d) Using your results, find the probability that you have one transplant operation and survive for at least 10 years.

e) Using your results, find the probability that you have two transplant operations and survive for at least 10 years.

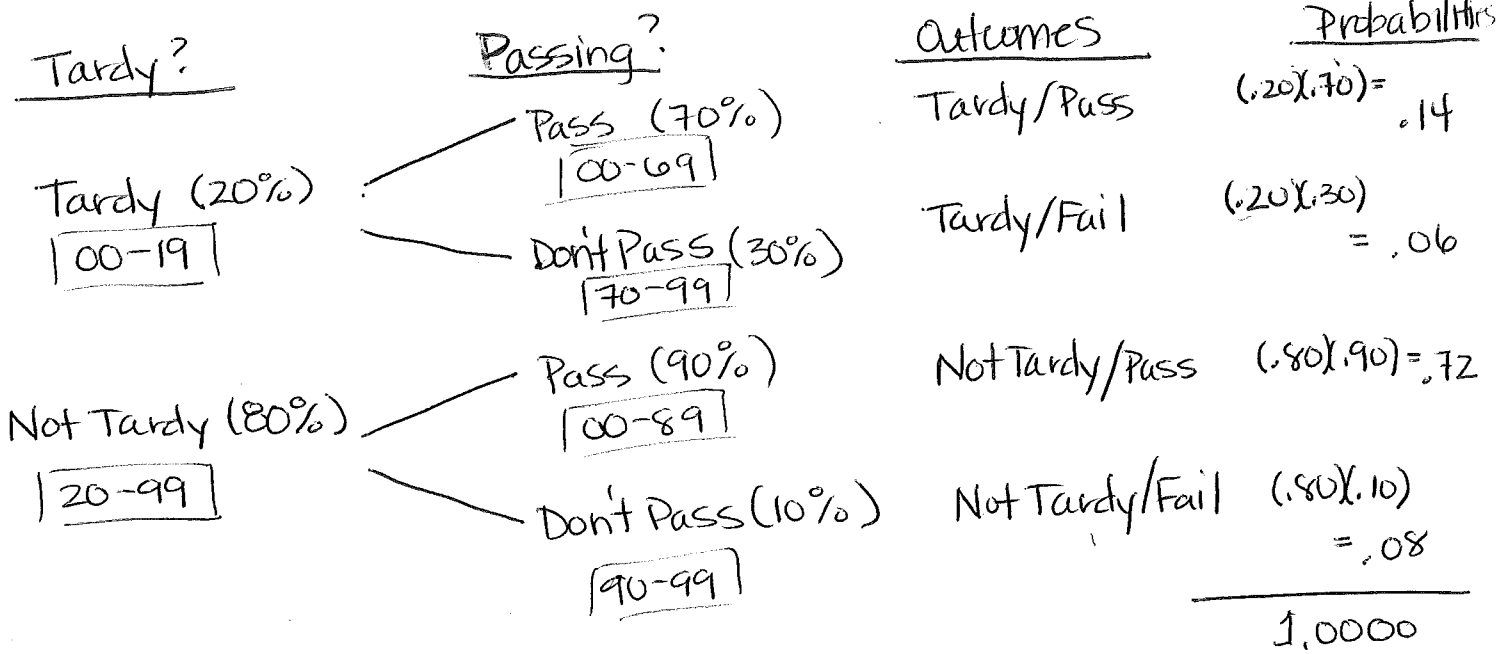
f) Using your results, find the probability that you have one *or* two transplant operations and survive for at least 10 years.

g) Calculate the actual probabilities for all the outcomes.

3. Your statistics teacher notices a strong correlation between the number of times a student is tardy and that students likelihood of passing the course. Here is the data collected:

- *20% of all stats students are tardy to 2nd hour.*
- *Of those who are tardy, 70% pass the course.*
- *Of those who are on time, 90% pass the course.*

a) Create a tree diagram to illustrate this situation.



b) Assign digits to simulate this situation (display these in your tree diagram).

c) Use line 128 in Table A to simulate 10 trials.

random numbers	15/68	91/42	27/06	56/51	43/74	13/35	24/93	67/81	98/28	72/09
outcome	T/P	NT/P	NT/P	NT/P	NT/P	T/P	NT/F	NT/P	NT/P	NT/P

d) Using your results, find the probability that a stats student is on time and passes the course.

= NT/P 7/10

e) Using your results, find the probability that a stats student is tardy and passes the course.

= T/P 2/10

f) Calculate the actual probabilities for all the outcomes.

see tree diagram

4. Many students spend their hard earned money on coffee in the morning.

- *Suppose 40% of all students do not drink coffee.*
- *Of the students that do drink coffee, 70% spend more than $4 per day.*

a) Create a tree diagram to illustrate this situation.

b) Assign digits to simulate this situation (display these in your tree diagram).

c) Use line 122 in Table A to simulate 10 trials.

random numbers										
outcome										

d) Using your results, find the probability that a randomly selected student spends more than $4 per day on coffee.

e) Using your results, find the probability that a randomly selected student does not drink coffee.

f) Calculate the actual probabilities for all the outcomes.

Unit 2: w.s. #9

Name Key (2016)

Period

For each problem:
(a) Determine if the problem is an "OR" or "AND" problem.
(b) Determine which category (ME, not ME, IND or DEP) the problem falls under.
(c) Find the probability.

AND
IND

1. What is the probability of rolling two 5's in a row using a 6-sided die? $\frac{1}{36}$

2. What is the probability of drawing a King followed by a 3 without replacement?

OR
ME

3. What is the probability of drawing a heart or diamond out of a deck of cards? $\frac{26}{52}$

4. What is the probability of rolling a 3 or 4 with a 6-sided die?

OR
Not ME

5. What is the probability of drawing a Jack or a heart from a deck of cards? $\frac{16}{52}$

6. What is the probability of drawing two Aces in a row with replacement?

AND
DEP

7. A student-teacher committee of 4 people is formed from a group of 20 students and 5 teachers.
   a) What is the probability that all 4 randomly chosen people are teachers? $\frac{120}{303,600}$

   b) What is the probability that all 4 randomly chosen people are students? $\frac{116,280}{303,600}$

   c) What is the probability that the first 2 are teachers and the second 2 students? $\frac{7600}{303,600}$

8. Anoka has 2600 students. There are 43 wrestlers and 32 hockey players. (It is impossible to be on both teams.) What is the probability of randomly selecting a wrestler or a hockey player from the whole student body?

OR Not ME 9. Out of Anoka's 2600 students, 62 boys play football, 43 wrestle, and 24 boys do both. What is the probability of selecting someone on the wrestling or football team? $\frac{81}{2600}$

10. What is the probability of drawing a Queen or a Jack from a deck of cards?

AND IND 11. The probability of getting a traffic ticket on any given day in Anoka is .002.

a) What is the probability of getting a ticket on 2 consecutive days? .000004

b) What is the probability of **not** getting a ticket on 2 consecutive days? .996004

c) What is the probability of **not** getting a ticket on 100 consecutive days? .819

12. P(A) = .7, P(B) = .4, A and B are independent. Find P(A and B).

OR ME 13. P(A) = .1, P(B) = .62, A and B are mutually exclusive. Find P(A or B). .72

14. P(A) = .21, P(B) = .53, P(A and B) = .18. Find P(A or B).

AND IND 15. P(A) = .374, P(B) = .528, A and B are independent. Find P(A and B). .197472

16. P(A) = .63, P(B) = .15, A and B are mutually exclusive. Find P(A and B).

OR Not ME 17. P(A) = .55, P(B) = .27, P(A and B) = .07. Find P(A or B). .75

18. P(A) = .8, P(B) = .6, A and B are independent. Find P(A and B).

OR ME 19. P(A) = .12, P(B) = .21, A and B are mutually exclusive. Find P(A or B). .33

20. P(A) = .32, P(B) = .56, A and B are mutually exclusive. Find P(A and B).

OR Not ME 21. P(A) = .31, P(B) = .93, P(A and B) = .28. Find P(A or B). .96

Unit 2: Review Name Key (2016) Hour____

1. A State mediator made a statement to the press saying, "The probability of reaching an agreement on a new contract within a week is 0.05." This statement means:

D

(a) A contract agreement is about to happen.
(b) It is likely a contract agreement will be reached within a week.
(c) A contract agreement may be reached within a week, it may not.
(d) It is very unlikely a contract agreement will be reached within a week.
(e) A contract agreement will definitely not be reached within a week.

2. A human resources director for a large corporation claims the probability a randomly selected employee arrives to work on time is 0.95. Suppose the first 4 randomly selected employees arrive for work late. What is the probability the next randomly selected employee arrives late?
(a) 0.95 (b) 0.50 (c) 0.19 (d) 0.05 (e) 0.25

3. Employees at a large university are classified in exactly one of several groups. Fifty percent of all employees are faculty and 35% of all employees are staff. What is the probability a randomly selected employee is not faculty or staff?

E

(a) 0.65 (b) 0.50 (c) 0.05 (d) 0.01 (e) 0.15

4. In government data, a household consists of all occupants of a dwelling unit. Choose an American household at random and count the number of people it contains. Here is the assignment of probabilities for your outcome:

Number of persons	1	2	3	4	5	6	7
Probability	0.25	0.32	???	???	0.07	0.03	0.01

The probability of 3 people in a household is the same as the probability of 4 people. The probability that a household contains 3 people must be
(a) 0.68 (b) 0.32 (c) 0.16 (d) 0.08 (e) none of these

6. Twenty out of a sample of 275 students say they are vegetarians. Of the vegetarians, 9 eat both fish and eggs, 3 eat eggs but not fish, and 8 eat neither. Choose one of the vegetarians at random. What is the probability that the chosen student eats neither fish nor eggs?

C

(a) 8/275 = 0.03 (b) 20/275 = 0.07 (c) 8/20 = 0.4 (d) 0.5 (e) 1

7. In backgammon, one rolls a pair of two fair dice. The probability of getting a sum of 7 is
(a) $\frac{3}{36}$ (b) $\frac{4}{36}$ (c) $\frac{5}{36}$ (d) $\frac{6}{36}$
(e) None of the above.

8. During his NBA career, Larry Bird made approximately 89% of all free throws. Suppose Larry makes 10 free throws in a row. What is the probability he will make the next free throw?

D

(a) 0.11 (b) 0.50 (c) 0.01 (d) 0.89 (e) 0.45

9. A simulation regarding magazine subscriptions is conducted using this assignment of digits.

Time = 00, 01, 02, ..., 49; **Newsweek** = 50, 51, 52, ..., 79; **Games** = 80, 81, 82, ..., 99

In repeated simulations, what do you expect the probability of subscribing to Newsweek to approach?

(a) 0.50 (b) 0.25 (c) 0.20 (d) 0.30 (e) 0.35

10. A store sells assorted candies in four different size boxes. The following model describes the probability of purchasing each size box.

Weight(oz.)	12	16	24	36
Probability	.05	.40	.45	.10

(a) Find the expected value of the weight of a box of assorted candies purchased at this store.

21.4oz

(b) What is the probability a randomly selected customer purchases a box that weighs more than the expected value?

.55

(c) What is the probability a customer purchases a box that weighs 12 or 16 oz.?

.45

(d) What is the probability a customer purchases a box not 12 oz.?

.95

11. What is the probability of rolling two 8's in a row using a 12-sided die?

OR ME **12.** What is the probability of rolling a 10 or 13 with a 20-sided die? 2/20

13. What is the probability of drawing a 4 and a 10 without replacement?

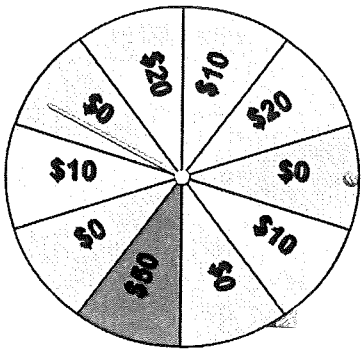
OR ME **14.** What is the probability of drawing a spade or diamond out of a deck of cards? 26/52

15. What is the probability of drawing a 2 or a club from a deck of cards?

AND IND **16.** What is the probability of drawing two hearts in a row with replacement? 169/2704

17. You pay $12.50 to spin the carnival spinner one time. You win the dollar amount displayed on the space you land on.

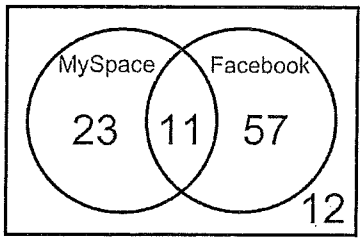
(a) Make a probability model.



(b) Find the expected value.

(c) Is the game fair? Why or why not?

18. The Venn diagram displays the results of a survey of 10th grade girls.



(a) P(MySpace and Facebook) = $\frac{11}{103}$

(b) P(MySpace or Facebook) = $\frac{91}{103}$

(c) P(not Facebook) = $\frac{35}{103}$

(d) P(Facebook but not MySpace) = $\frac{57}{103}$

(e) P(neither MySpace nor Facebook) = $\frac{12}{103}$

19. Use the table to answer the following:

	Male	Female
Eat school lunch	192	163
Bring own lunch	26	51
Skip lunch	5	2

(a) P(school lunch or skip lunch) = $\frac{362}{439}$

(b) P(Female or bring own lunch) = $\frac{242}{439}$

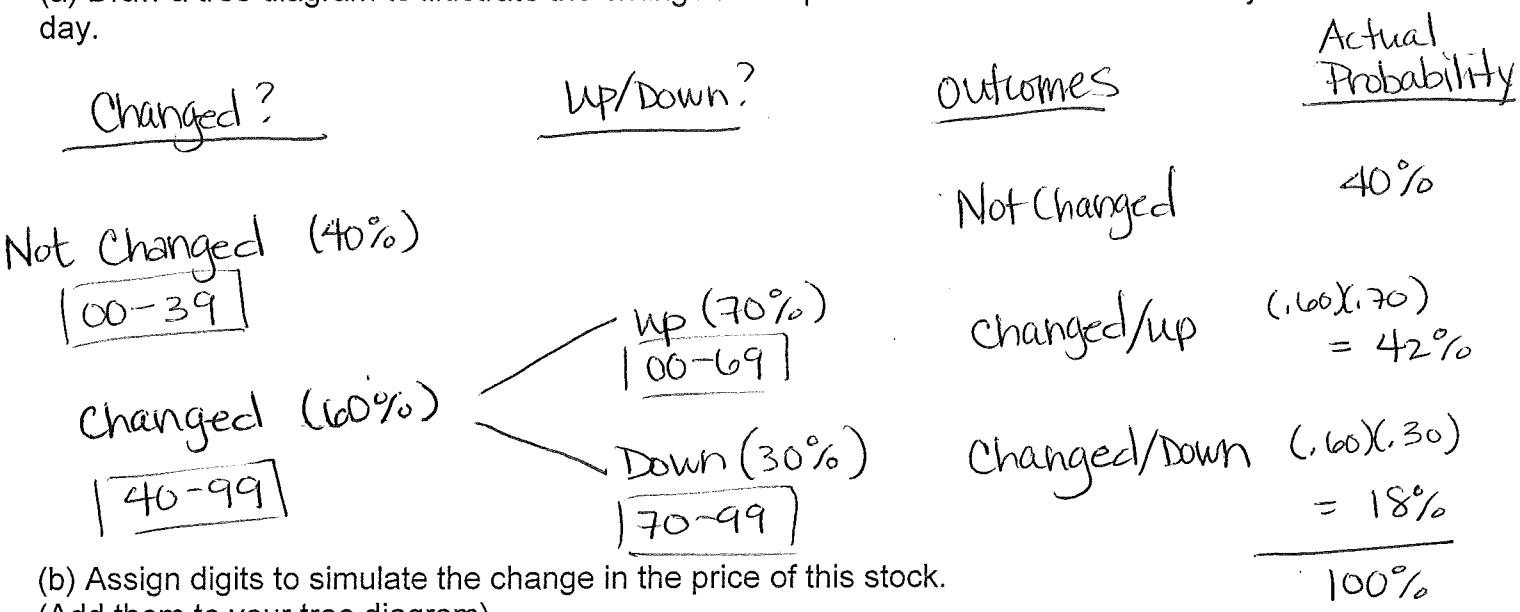
(c) P(Male and eat school lunch) = $\frac{192}{439}$

(d) P(Female given skip lunch) = $\frac{2}{7}$

(e) P(Bring own lunch given male) = $\frac{26}{223}$

20. On any given day, suppose the price of a certain stock remains unchanged with probability 0.40. If the price changes, it goes up with probability 0.70 and goes down with probability 0.30.

(a) Draw a tree diagram to illustrate the change in the price of this stock on a randomly selected day.



(b) Assign digits to simulate the change in the price of this stock. (Add them to your tree diagram).

(c) Use the random digits below to simulate the change in the stock price for 10 random days.

07511 88915 41267 16853 84569 79367 32337 03316 48311 59779 015459 48999

random numbers										
outcome										

(d) Using your simulation results, estimate the probability that the stock price went up.

(e) Find the actually probabilities for all three outcomes.

See tree diagram