Name Key Alg2CC Unit 12 Test Review

1a) Pete's Pizza has 3 cheese choices. There are meat choices of pepperoni, sausage, bacon or no meat. Vegetable choices include none, mushrooms, green peppers or onions. Crust choices include original, thin or pan. How many different pizzas can be made?

3 cheese × 4 meat × 4 Veg × 3 Crust = 144

b) Pete just now ran out of mushrooms. How many fewer pizza types can be made?

3 × 4 × 3 × 3 = 108 144 − 108 = 36 fewer

2. How many 4 character passwords can be made from a letter number combination (no special characters) if the first character is an upper case letter, the 2nd is a lower case letter and the last character is a number.

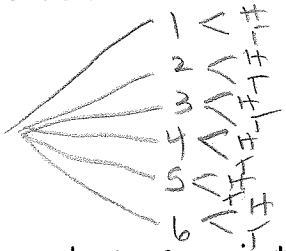
$\frac{26}{A-Z} \times \frac{26}{a-z} \times \frac{62}{\substack{A-Z \\ a-z \\ 0-9}} \times \frac{10}{0-9}$

3a) What are the 3 ways to represent a probability?

decimal, fraction, percent

b) Graph the interval on a number line representing all possible probability values.

4a) After a six sided die is tossed, a fair coin is flipped. Draw an appropriate tree diagram.



b) How many outcomes are in this sample space? 12 (6 × 2)

c) Event A is getting an even number. Event B is getting a number greater than 3. Determine the following probabilities.

P(A) = $\frac{6}{12}$ or $\frac{3}{6}$ (2, 4, 6) P(B) = $\frac{4}{12}$ or $\frac{3}{6}$ or $\frac{1}{2}$ (4, 5, 6) P(A and B) = $\frac{4}{12} = \frac{1}{3}$ (4, 6) P(A or B) = $\frac{8}{12} = \frac{2}{3}$ (2, 4, 6, 5)

d) Event C is getting an odd number. Event D is flipping a tails. Determine the following probabilities.

P(C ∩ D) = P(C and D) = $\frac{3}{12}$ P(C ∪ D) = P(C or D) = $\frac{9}{12}$ P(not C ∩ D) = P(E and T) = $\frac{3}{12}$ P(C ∪ not D) = P(C or H) = $\frac{9}{12}$

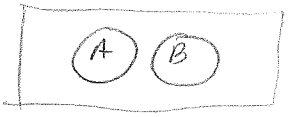
5a) The P(E) and the P(not E) are called complements. (spelling counts!)

b) Probabilities that are [part a answer] complements always sum to 1.

c) If the P(E) = .35, then the P(E') = .65

P(E') = 1 − P(E) = 1 − .35 = .65

6a) Two events, A and B, are mutually exclusive or disjoint. Draw an appropriate Venn diagram. (no both)



b) Even with no numbers in this Venn Diagram, what probability or probabilities could you calculate and what is it?

P(A and B) = 0

7a) The two-way table provides data about 300 randomly chosen people who visit an amusement park. Complete the table.

	Discount Admission	Regular Admission	TOTAL
Purchases ride tickets	60	120	180
Does not purchase ride tickets	40	80	120
TOTAL	100	200	300

b) Determine the probability, as a fraction and 3 decimal places, that a visitor to the amusement park purchases ride tickets given the visitor pays for discount admission.

$P(R|D) = \frac{60}{100} = .600$

c) Determine the probability, as a fraction and 3 decimal places, that a visitor to the amusement park pays for regular admission given the visitor purchases ride tickets.

$P(No\ D|R) = \frac{120}{180} = .667$

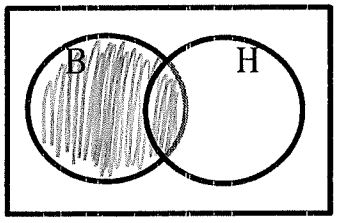
d) Determine the probability, as a fraction and 3 decimal places, that a visitor purchases ride tickets. $P(R) = 180/300 = .600$

e) Determine and justify if the events purchases ride tickets and pays for discount admission are independent.

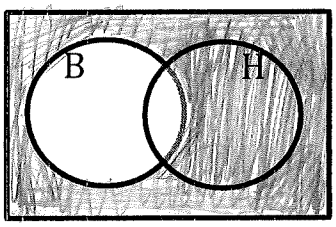
$P(R) = P(R|D)$ ∴ Events are Indep.

8. Let a Venn Diagram represent students in a classroom. Some have brown hair (B). Some have hazel colored eyes (H). Some have both and some have neither. On the Venn diagrams provided, shade the region representing students who

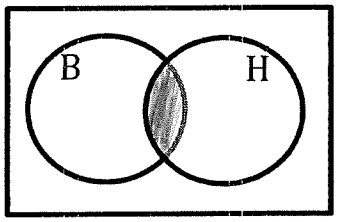
a. have brown hair.



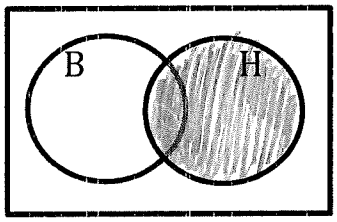
b. do not have brown hair



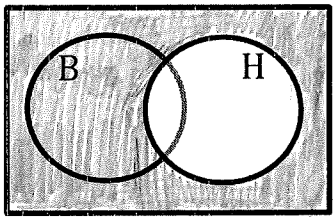
c. have brown hair and hazel eyes



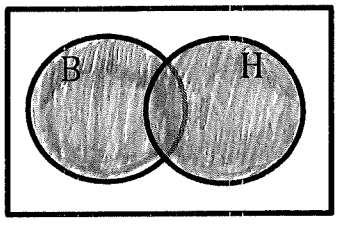
d. have hazel eyes



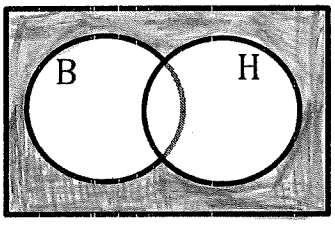
e. do not have hazel eyes



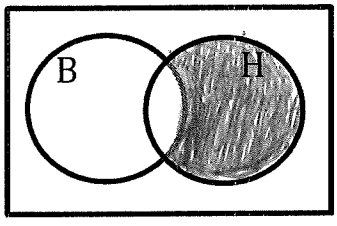
f. have brown hair or hazel eyes



g. have neither brown hair nor hazel eyes



h. have hazel eyes but not brown hair



9. Consider a dust speck where a community of people live and are called Whos. 80% of the Whos like green eggs, 60% like ham, and 48% like green eggs and ham. Complete the hypothetical 1000 two-way frequency table.

	Whos who like ham (H)	Whos who do not like ham (Not H)	TOTAL
Whos who like green eggs (G)	480	320	800
Whos who do not like green eggs (Not G)	120	80	200
TOTAL	600	400	1000

For a - h, find the following probabilities as a fraction and a percent.

a. A Who likes green eggs. $\frac{800}{1000}$, 80%

b. A Who likes ham. $\frac{600}{1000}$, 60%

c. A Who likes green eggs and ham. $\frac{480}{1000}$, 48%

$P(G) + P(H) - P(G \text{ or } H)$
$800 + 600 - 480$
1000

d. A Who likes green eggs or ham. $\frac{920}{1000}$, 92%

e. A Who likes green eggs and does not like ham. $\frac{320}{1000}$, 32%

f. If a Who likes ham (G), this Who does not like green eggs. $\frac{120}{600}$, 20%

g. Describe the complement of part (a) and find its probability. $\frac{200}{1000}$, 20%

$P(\text{not } G) = 1 - P(G)$

h. Describe the complement of part (b) and find its probability. $\frac{400}{1000}$, 40%

$P(\text{Not } H) = 1 - P(H)$

i. Using one or more conditional probabilities, determine and justify if the events *a Who likes green eggs* and *a Who likes ham* are independent.

$P(G) = .800$
$P(G|H) = 480/600 = .800$
$P(G|\text{Not } H) = 320/400 = .800$
} Indep. b/c condition prob. are =.

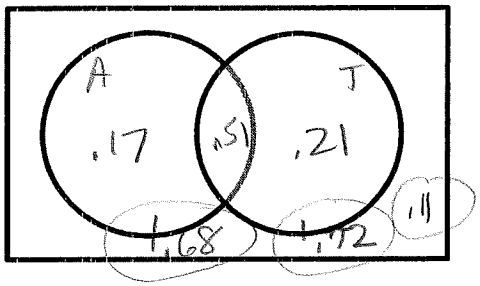
$P(G) = P(G|H) = P(G|\text{Not } H)$

OR: Mult. Rule:

$P(G \cap H) \stackrel{?}{=} P(G) * P(H)$
$.48 = .8 * .6$
$.48 = .48$ ∴ Indep.

OR: Mult. Rule: $P(H) = P(H|G)$

10. In a large community, 68% of the people are adults (A), 72% of the people have traveled outside the state (T), and 11% are not adults who have not traveled outside the state. Complete a Venn Diagram by writing the probabilities as decimals in the appropriate regions.



$.68 + .72 + .11 = 1.51$

-1

$P(\text{BOTH}) = .51$

a. What is the P(A')?

$P(A) = .68$

$P(A') = 1 - .68 = .32$

or $.21 + .11 = .32$

b. What is the P(T')?

$P(T) = .72$

$P(T') = 1 - .72 = .28$

or $.17 + .11 = .28$

c. What is the P(A∪T)?

$.17 + .51 + .21 = .89$ OR

or $1 - .11 = .89$

d. What is the P(A∩T)?

.51

e. What is the P(A∩T')?

$= P(\text{just } A) = .17$

f. What is the P(T∩A')?

$= P(\text{just } T) = .21$

g. Verify that your Venn Diagram probabilities sum to 1 or 100%

$.17 + .51 + .21 + .11 = 1.00$

h. Are the 2 events *people are adults* and *people have traveled outside the state* independent? Justify by using the multiplication rule of independence.

$P(A \cap T) \stackrel{?}{=} P(A) * P(T)$

$.51 \stackrel{?}{=} (.68)(.72)$

$.51 \neq .4896$

∴ Not independent