

CCM2 – Probability Review

Name: Key

Probability Test – Be able to answer the following:

1. Venn Diagrams:

- draw them
- answer simple questions
- determine probability

2. Union, intersection and complement of sets

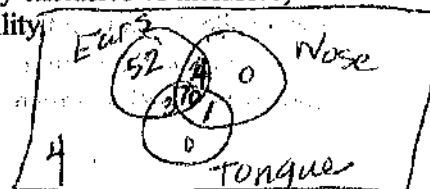
3. Determine sample space

4. Determine number of possible outcomes

- counting principle

5. Probability

- "baby" probability of one item
- compound probability
 - multiplying (independent vs dependent)
 - adding (mutually exclusive vs inclusive)
- conditional probability



REVIEW:

(Create a venn diagram for the following)

1. 74 models were hired for the spring shows at a certain Paris design house and the following information about their body piercing was compiled. Note: Ears count as one piercing.

- Among the models with pierced ears combined with another body piercing, half the difference between all three parts pierced and only ears and nose pierced have only their ears and tongue pierced.
- There are 10 models who had all three parts pierced.
- 18 models have multiple piercings.
- All but 5 models have pierced ears.
- No model has pierced her nose or her tongue without piercing her ears as well, but one pierced both her nose and her tongue without piercing her ears.

2. The following table shows the results of a survey in which 90 dog owners were asked (1)

how much they have spent in the last year on their dog's health care and (2) whether their dogs were purebred or mixed breeds. The results are summarized in the table below.

		Type of Dog		
		Purebred	Mixed Breed	Total
Health Care	Less than \$100	19	21	40
	\$100 or more	35	15	50
	Total	54	36	90

a. Find the probability that \$100 or more was spent on a randomly selected dog's health care in the last year.

$$\frac{50}{90} = \frac{5}{9}$$

b. Given that a randomly selected dog owner spent less than \$100, find the probability that the dog was a mixed breed.

$$\frac{21}{40}$$

c. Find the probability that a randomly selected dog owner spent \$100 or more on health care and the dog was a mixed breed.

$$\frac{15}{90} = \frac{1}{6}$$

3. If you roll a die and pick a card from a standard deck, how many outcomes are possible?

$$6 \times 52 = 312$$

4. IF $A = \{2, 3, 4, 5, 6, 7, 8, 9\}$ $B = \{6, 8, 10\}$ Create a Venn Diagram of the sets

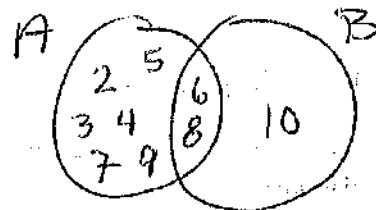
a. find $A \cup B$

b. find $A \cap B$

c. A^c

$$\{2, 3, 4, 5, 6, 7, 8, 9, 10\} \quad \{6, 8\}$$

$$\{10\}$$



5. In homeroom, 3 of the 16 girls have red hair and 2 of the 15 boys have red hair. What is the probability of selecting a boy or a red-haired person as homeroom representative to student council?

$$\frac{15}{31} + \frac{5}{31} - \frac{2}{31} = \frac{18}{31}$$

6. Lynn collects stamps from different countries. He has five from Canada, two from France, one from Russia, four from Great Britain, and one from Germany. If he accidentally loses one stamp, what is the probability that it is the stamp from Russia?

$$\frac{1}{13}$$

7. Compute the probability of drawing two aces from a well-shuffled deck of 52 cards if the first card is not replaced before the second card is drawn.

$$\frac{4}{52} \cdot \frac{3}{51} = \frac{1}{13} \cdot \frac{1}{17} = \frac{1}{221}$$

8. Suppose you are going to throw two fair dice. What is the probability of getting a 5 on the first die and a 5 on the second die?

$$\frac{1}{6} \cdot \frac{1}{6} = \frac{1}{36}$$

9. If a fair die is thrown, find the probability the face shows a number greater than 2 given that it is prime.

$$\frac{2}{3}$$

10. A standard deck of cards is shuffled and one card is drawn. Find the probability that the card is red or a jack.

$$\frac{26}{52} + \frac{4}{52} - \frac{2}{52} = \frac{28}{52} = \frac{7}{13}$$

11. In a box of 11 parts, four of the parts are defective. Two parts are selected at random, one at a time, without replacement.

a. Find the probability that both parts are defective.

$$\frac{4}{11} \cdot \frac{3}{10} = \frac{6}{55}$$

b. Find the probability that both parts are not defective.

$$\frac{7}{11} \cdot \frac{6}{10} = \frac{21}{55}$$

12. The two-way table shows the favorite leisure activities for 50 adults - 20 men and 30 women. If a person were selected at random from the above survey:

a) What is the probability that a person selected is a women?

$$\frac{30}{50} = \frac{3}{5}$$

b) What is the probability that a person selected likes to dance?

$$\frac{18}{50} = \frac{9}{25}$$

c) What is the probability that a person selected likes sports given that they are male?

$$\frac{10}{16}$$

	Dance	Read	Travel	Other
Men	2	10	8	20
Women	16	6	8	30
Total	18	16	16	50