10.3 Venn Diagrams and Set Theory

Vocabulary: Match the word with its definition.

_____ 1. Sample Space

_____ 2. Event or Subset

_____ 3. Complement

A. An outcome or set of outcomes from the sample space.
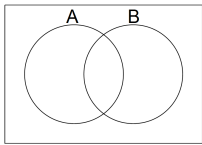
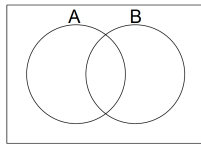B. The set of all possible outcomes for an activity or experiment.

C. All outcomes in the sample space that are not part of an event.
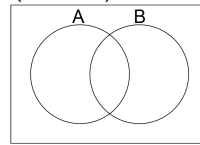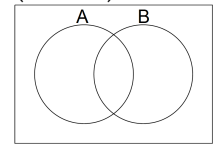
Shade the appropriate region of the Venn Diagram.
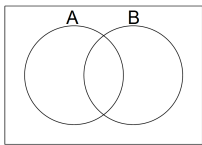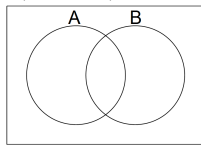
4. A

5. B^C
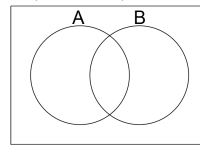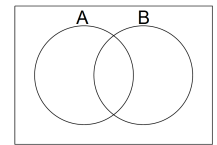
6. $(A \cup B)$

7. $(A \cap B)$

8. $A - B$

9. $(A \cup B)^C$

10. $(A \cap B)^C$

11. $A^C \cup B$

12. List the animals in the requested sets. Make sure to use braces { }.
   Chance Process: Randomly choosing an animal from a list of animals your teacher could think of at 2 AM.
   a. Sample Space

   b. Subset A (animals with three letter names)
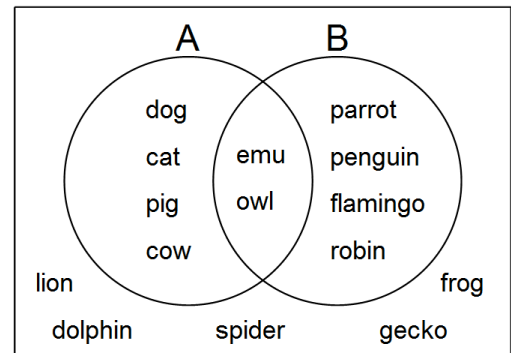
   c. Subset B (birds)

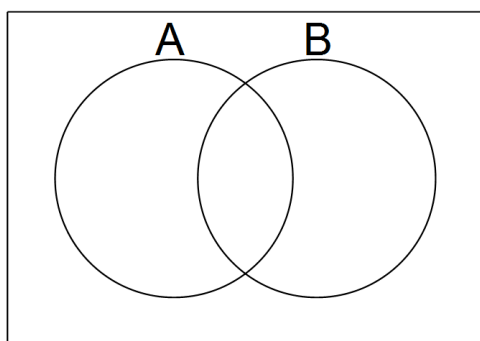   d. $A \cup B$

   e. $A \cap B$
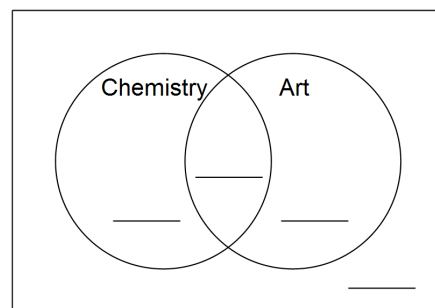
   f. B^C

   g. $B - A$

   h. $(A \cup B)^C$

Venn diagram:
A: dog, cat, pig, cow
A ∩ B: emu, owl
B: parrot, penguin, flamingo, robin
Outside: lion, dolphin, spider, frog, gecko

13. Sample Space: S = {pen, pencil, elastic band, safety pin, Kleenex, battery, scissors, tape, calculator, magnet, staples}

    a. List the items in subset A = things with a point

    b. List the items in subset B = things used to hold other things together

    c. List the items in the union of A and B.

    d. List the items in the intersection of A and B.

    e. Fill in the Venn diagram, placing the appropriate items in each region.

14. In a survey of 100 students, 40 students are taking chemistry, and 50 students are taking art. 15 students are taking chemistry and art.

    a. Fill in the Venn diagram with the correct numbers of students.

    b. How many students are taking only art?

    c. How many students are taking only chemistry?

    d. How many students are taking chemistry or art?

    e. How many students are not taking either class?

15. Eighty-seven contestants are entered in a talent show. Fifty-eight of the acts involved music, and 25 of the acts involved animals. Fourteen of the acts involved music and animals.

    a. Fill in the Venn diagram with the correct numbers of acts.

    b. How many acts involved music but not animals?

    c. How many acts involved animals but not music?

    d. How many acts involved music or animals?
    e. How many acts didn't involve either animals or music?