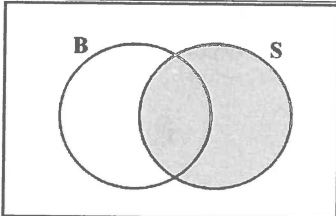
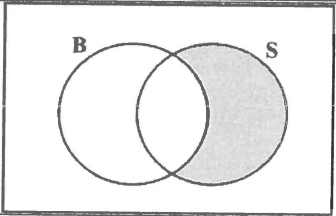
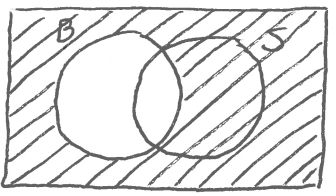
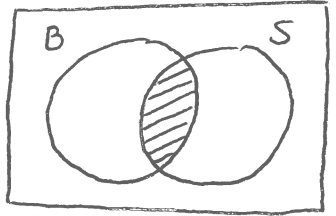
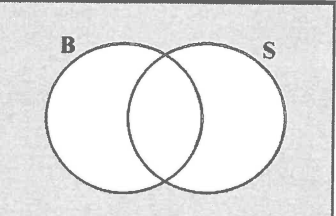


MATH 126
 Quiz #4: Venn Diagrams

Name: Key

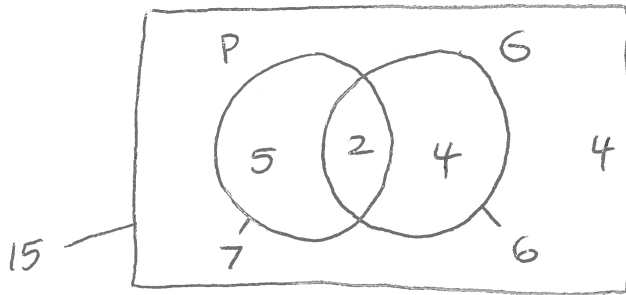
Directions: Read each question carefully and write your answers in the space provided. Be sure to support your answers with detailed reasoning. You may use a calculator but correct answers without the supporting work will not receive full credit.

1. (14 points) In the table below, complete each situation so that the Venn diagram, mathematical notation, and written description *all match in any given row*. Given the universe of cars, let B = cars that are blue and S = cars with a sun roof. The first row has been done for you.

Venn diagram	Mathematical notation	Written description
	S	Cars with a sun roof
	$S - B$ or $S \cap \bar{B}$	Cars with a sun roof that aren't blue
	\bar{B}	Cars that are not blue
	$B \cap S$	Blue cars with a sun roof
	$\overline{B \cup S}$ or $\bar{B} \cap \bar{S}$	Cars that are neither blue nor have a sun roof

For problems 2 and 3, draw a Venn diagram to assist in solving the problem. Be sure to answer the original question.

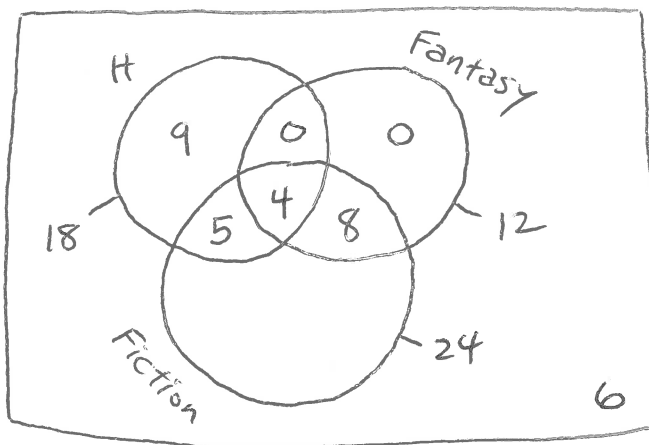
2. (10 points) In a music club with 15 members, 7 people played piano, 6 people played guitar, and four people didn't play either of these two instruments. How many people played both piano and guitar?



Both piano & guitar:
2 people

3. (10 points) Sam has 18 hardback books.
All of Sam's fantasy books are fiction.
Sam has 12 fantasy books.
One-third of Sam's fantasy books are hardback books.
Sam has 6 paperback books that are non-fiction.
Sam has 24 fiction books.
Five of Sam's books are hardback books that are fiction but not fantasy-fiction.
How many books does Sam have?

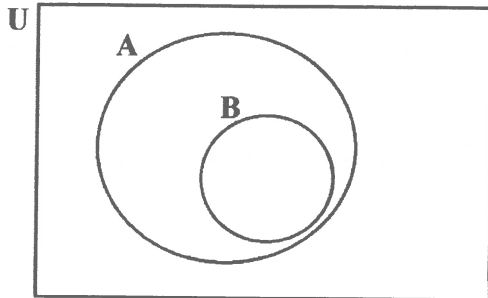
Sam's books



$$\# \text{ books} = 24 + 9 + 6 = 39$$

4. (16 points) Give examples (written descriptions) of the universe U and sets A and B where the Venn diagram looks like...

(a) Scenario 1:

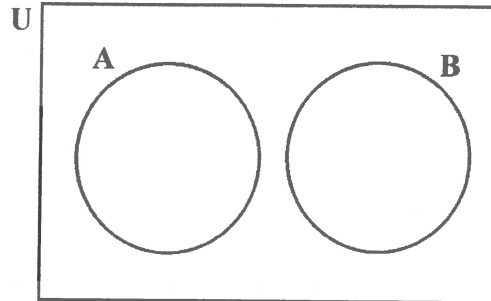


$U =$ all people in the world

$A =$ people born in Wisconsin

$B =$ people born in River Falls

(b) Scenario 2:



$U =$ (same)

$A =$ people born with blue eyes

$B =$ people born with brown eyes

In Scenario 1, the sets A and B relate in a very specific way. Describe in a sentence or two how the two sets are related:

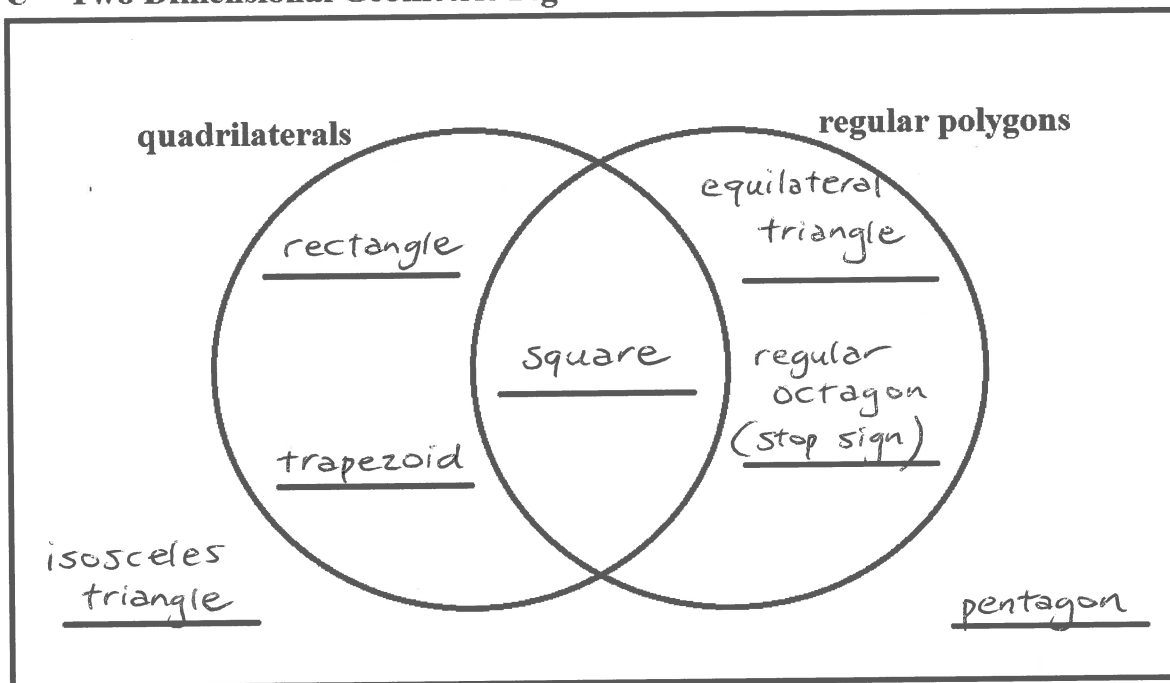
B is a subset of A . If you are a member of set B (born in River Falls), then you are automatically a member of set A (born in Wisconsin).

In Scenario 2, the sets A and B relate in a very specific way. Describe in a sentence or two how the two sets are related:

The sets are disjoint. That is, $A \cap B = \emptyset$. Generally speaking, if you are a member of set A (blue eyes), you cannot also be a member of set B (brown eyes).

5. (7 points) Consider the Venn diagram below. Fill in each of the seven blanks with the name of an appropriate geometric figure (e.g., since an “isosceles triangle” is a two-dimensional geometric figure, you may use this term to fill in one of the blanks).

U = Two Dimensional Geometric Figures



Other answers are possible