

Page 20 #1

1. Consider the following sets:

- $U = \{2, 3, 4, 6, 8, 9, 10, 12, 14, 15\}$
- $A = \{3, 6, 9, 12, 15\}$
- $B = \{2, 4, 6, 8, 10, 12, 14\}$

a) Illustrate these sets using a Venn diagram.

b) Determine the number of elements

- |                                     |                             |
|-------------------------------------|-----------------------------|
| i) in set $A$ .                     | v) in set $A$ and set $B$ . |
| ii) in set $A$ but not in set $B$ . | vi) in set $A$ or set $B$ . |
| iii) in set $B$ .                   | vii) in $A'$ .              |
| iv) in set $B$ but not in set $A$ . |                             |

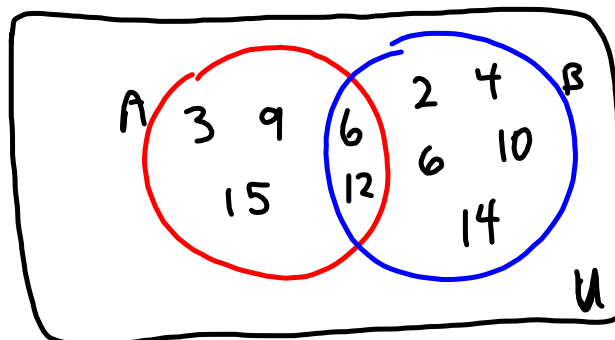
b) i)  $n(A) = 5$

ii)  $n(A \setminus B) = 3$

iii)  $n(B) = 7$

iv)  $n(B \setminus A) = 5$

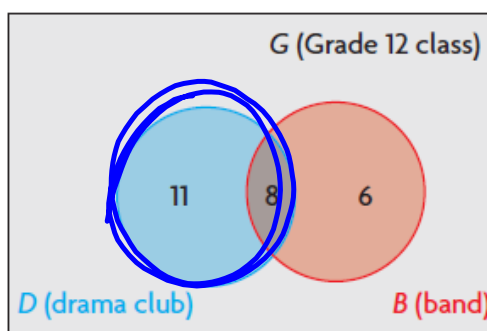
v)  $n(A \cap B) = 2$



vi)  $n(A \cup B) = 10$

vii)  $n(A') = 5$

2. There are 38 students in a Grade 12 class. The number of students in the drama club and the band are illustrated in the Venn diagram. Use the diagram to answer the following questions.



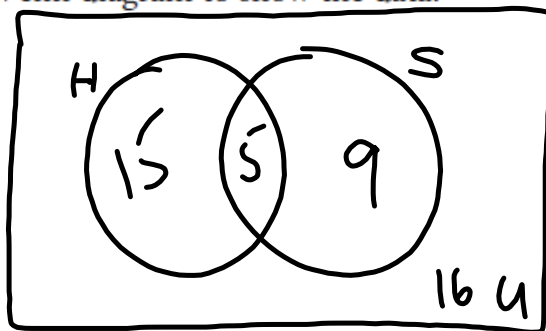
- How many students are in both the drama club and the band?
- How many students are in the drama club but not in band?  
How many are in the band but not in the drama club?
- How many students are in the drama club? How many are in the band?
- How many students are in at least one of the drama club or the band?
- How many students are in neither the drama club nor the band?

$$\begin{aligned}
 \text{a) } n(D \cap B) &= 8 & \text{(b) } n(D \setminus B) &= 11, n(B \setminus D) = 6 \\
 \text{(c) } n(D) &= 19, n(B) &= 14 & \text{(d) } n(D \cup B) = 25 \\
 \text{(e) } n(D \cup B)' &= 13
 \end{aligned}$$

3. Anna surveyed 45 students about their favourite sports. She recorded her results.

Favourite Sports	Number of Students
hockey	20
soccer	14
neither hockey nor soccer	16

- a) Determine how many students like hockey and soccer.
- b) Determine how many students like only hockey or only soccer.
- c) Draw and label a Venn diagram to show the data.

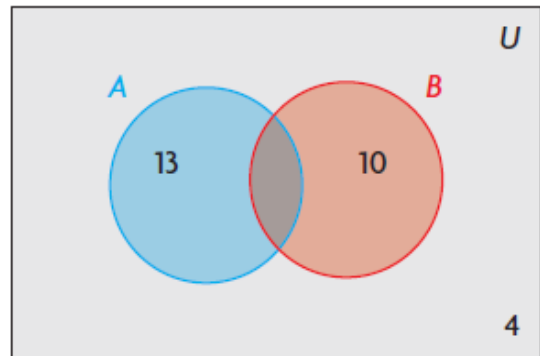


Handwritten calculation:  

$$\begin{array}{r} 34 \\ - 16 \\ \hline 50 \\ - 45 \\ \hline 5 \end{array}$$

4. There are 55 guests at a ski resort in British Columbia. Of these guests, 25 plan to go skiing and 32 plan to go snowboarding. There are 9 guests who do not plan to ski or snowboard.
- Determine how many guests plan to ski and snowboard.
  - Determine how many guests plan to only ski.
  - Determine how many guests plan to only snowboard.

5. Ryan drew the following Venn diagram incorrectly. There are 25 items in the universal set,  $U$ , and 4 items that are not in set  $A$  or set  $B$ .



- Determine  $n(A \text{ and } B)$ ,  $n(A \text{ only})$ , and  $n(B \text{ only})$ .
- Redraw Ryan's Venn diagram with the data you determined in part a).