1. A group of 30 children are surveyed to find out which of the three sports cricket (C), basketball (B) or volleyball (V) they play. The results are as follows:

3 children do not play any of these sports
2 children play all three sports
6 play volleyball and basketball
3 play cricket and basketball
6 play cricket and volleyball
16 play basketball
12 play volleyball.

(a) Draw a Venn diagram to illustrate the relationship between the three sports played.

(1)

(b) On your Venn diagram indicate the number of children that belong to each region.

(3)

(c) How many children play only cricket?

(2)

(Total 6 marks)

2. A poll was taken of the leisure time activities of 90 students.

60 students watch TV (T), 60 students read (R), 70 students go to the cinema (C).
26 students watch TV, read **and** go to the cinema.
20 students watch TV and go to the cinema only.
18 students read and go to the cinema only.
10 students read and watch TV only.

(a) Draw a Venn diagram to illustrate the above information.

(b) Calculate how many students

(i) only watch TV;

(ii) only go to the cinema.

(Total 8 marks)

3. The following results were obtained from a survey concerning the reading habits of students.

60% read magazine P
50% read magazine Q
50% read magazine R
30% read magazines P and Q
20% read magazines Q and R
30% read magazines P and R
10% read all three magazines

(a) Represent all of this information on a Venn diagram.

(4)

(b) What percentage of students read exactly two magazines?

(1)

(c) What percentage of students read at least two magazines?

(1)

(d) What percentage of students do not read any of the magazines?

(1)

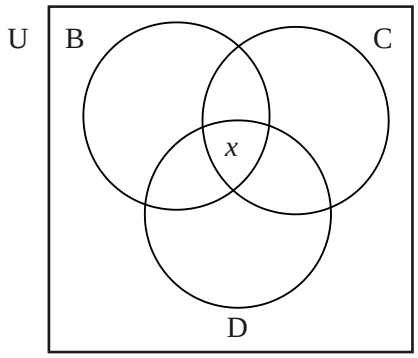
(Total 7 marks)

4. A school offers three activities, basketball (*B*), choir (*C*) and drama (*D*). Every student must participate in at least one activity.

16 students play basketball only.
18 students play basketball and sing in the choir but do not do drama.
34 students play basketball and do drama but do not sing in the choir.
27 students are in the choir and do drama but do not play basketball.

(a) Enter the above information on the Venn diagram below.

(2)



99 of the students play basketball, 88 sing in the choir and 110 do drama.

(b) Calculate the number of students *x* participating in all three activities.

(1)

(c) Calculate the total number of students in the school.

(3)
(Total 6 marks)

5. One day the number of customers at three cafés, "Alan's Diner" (*A*), "Sarah's Snackbar" (*S*) and "Pete's Eats" (*P*) was recorded and are given below.

17 were customers of Pete's Eats only
27 were customers of Sarah's Snackbar only
15 were customers of Alan's Diner only
10 were customers of Pete's Eats **and** Sarah's Snackbar **but not** Alan's Diner
8 were customers of Pete's Eats **and** Alan's Diner **but not** Sarah's Snackbar

(a) Draw a Venn Diagram, using sets labelled *A*, *S* and *P*, that shows this information.

(3)

There were 48 customers of Pete's Eats that day.

(b) Calculate the number of people who were customers of all three cafés.

(2)

There were 50 customers of Sarah's Snackbar that day.

(c) Calculate the total number of people who were customers of Alan's Diner.

(3)

(d) Write down the number of customers of Alan's Diner that were also customers of Pete's Eats.

(1)

(e) Find $n[(S \cup P) \cap A']$.

(2)
(Total 11 marks)

6. U is the set of all the **positive** integers less than or equal to 12.
A, B and C are subsets of U.

$A = \{1, 2, 3, 4, 6,12\}$
$B = \{\text{odd integers}\}$
$C = \{5, 6, 8\}$

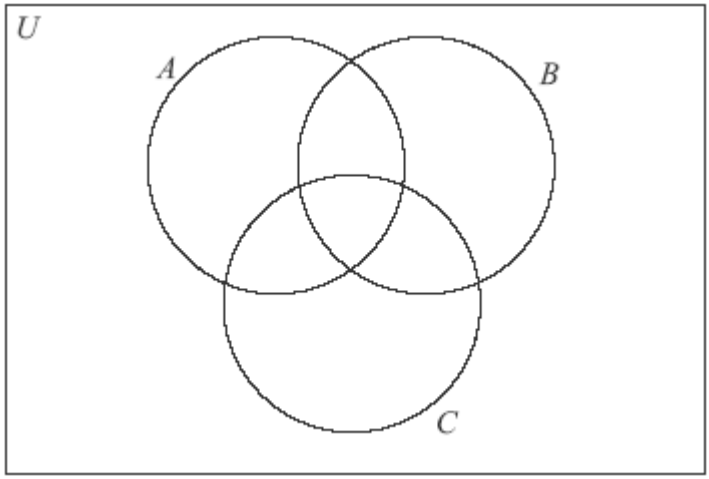
(a) Write down the number of elements in $A \cap C$.

(1)

(b) List the elements of B.

(1)

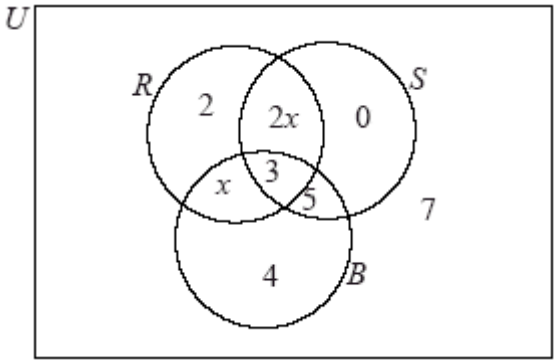
(c) Complete the following Venn diagram with **all** the elements of U.



(4)

(Total 6 marks)

7. A survey was carried out in a year 12 class. The pupils were asked which pop groups they like out of the *Rockers* (R), the *Salseros* (S), and the *Bluers* (B).
The results are shown in the following diagram.



(a) Write down $n(R \cap S \cap B)$.

(1)

(b) Find $n(R')$.

(2)

(c) Describe which groups the pupils in the set $S \cap B$ like.

(2)

(d) Use set notation to describe the group of pupils who like the *Rockers* and the *Bluers* but do not like the *Salseros*.

(2)

There are 33 pupils in the class.

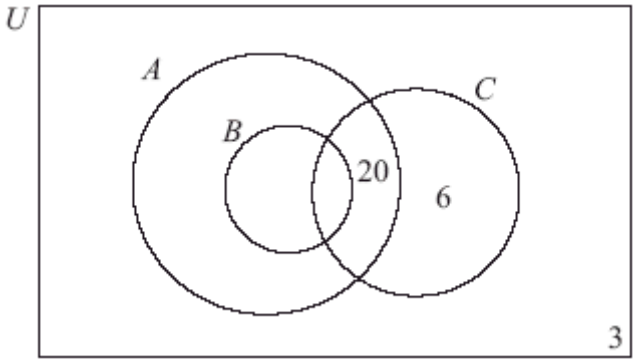
(e) (i) Find x.

(ii) Find the number of pupils who like the *Rockers*.

(3)
(Total 10 marks)

8. The Venn diagram below represents the students studying Mathematics (A), Further Mathematics (B) and Physics (C) in a school.

50 students study Mathematics
38 study Physics
20 study Mathematics and Physics but not Further Mathematics
10 study Further Mathematics but not Physics
12 study Further Mathematics and Physics
6 study Physics but not Mathematics
3 study none of these three subjects.



(a) Copy and complete the Venn diagram **on your answer paper**.

(3)

(b) Write down the number of students who study Mathematics but not Further Mathematics.

(1)

(c) Write down the total number of students in the school.

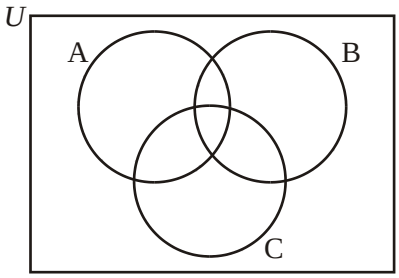
(1)

(d) Write down $n(B \cup C)$.

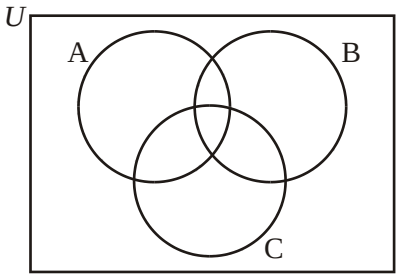
(2)
(Total 7 marks)

9. Shade the given region on the corresponding Venn Diagram.

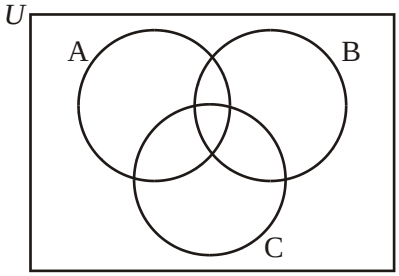
(a) $A \cap B$



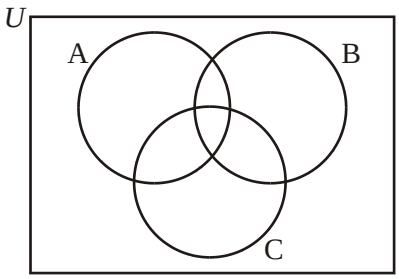
(b) $C \cup B$



(c) $(A \cup B \cup C)'$



(d) $A \cap C'$



(Total 8 marks)