1. Consider the universal set $U = \{x \in \mathbb{N} \mid 3 < x < 13\}$, and the subsets $A = \{\text{multiples of } 3\}$ and $B = \{4, 6, 12\}$.

(a) List the elements of the following sets.

(i) A

(ii) $A \cap B'$

(2)

(b) Write down one element of $(A \cup B)'$.

(2)

(c) One of the statements in the table below is false. Indicate with an **X** which statement is false. Give a reason for your answer.

$n(A \cup B) = 4$	
$15 \in A'$	
$A \subset A \cup B$	

(2)
(Total 6 marks)

2. The universal set U is the set of integers from 1 to 20 inclusive.

A and B are subsets of U where:
A is the set of even numbers between 7 and 17.
B is the set of multiples of 3.

List the elements of the following sets:

(a) A;

(1)

(b) B;

(1)

(c) $A \cup B$;

(2)

(d) $A \cap B'$.

(2)
(Total 6 marks)

3. Let $U = \{-4, -\frac{2}{3}, 1, \pi, 13, 26.7, 69, 10^{33}\}$.

A is the set of all the integers in U.

B is the set of all the rational numbers in U.

(a) List all the prime numbers contained in U.

(b) List all the members of A.

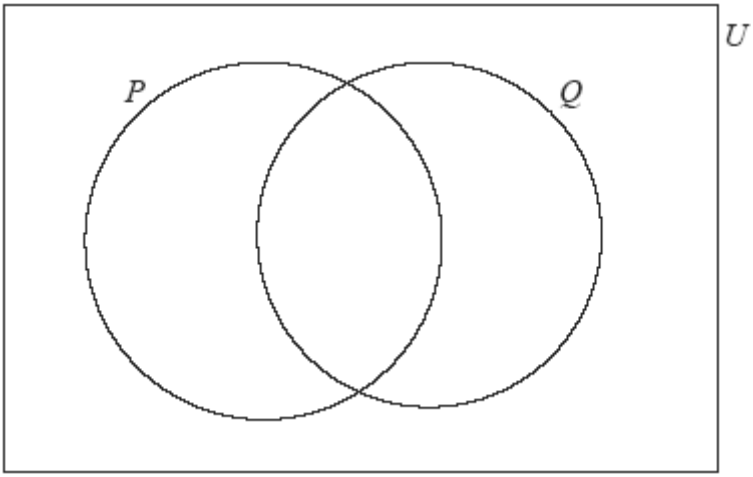
(c) List all the members of B.

(d) List all the members of the set $A \cap B$.

(Total 8 marks)

4. The sets P, Q and U are defined as

U = {Real Numbers}, P = {Positive Numbers} and Q = {Rational Numbers}.



Write down in the correct region on the Venn diagram the numbers

$\frac{22}{7}$, 5×10^{-2}, $\sin(60°)$, 0, $\sqrt[3]{-8}$, $-\pi$

(Total 6 marks)

5. The universal set U is defined as the set of positive integers less than 10. The subsets A and B are defined as:

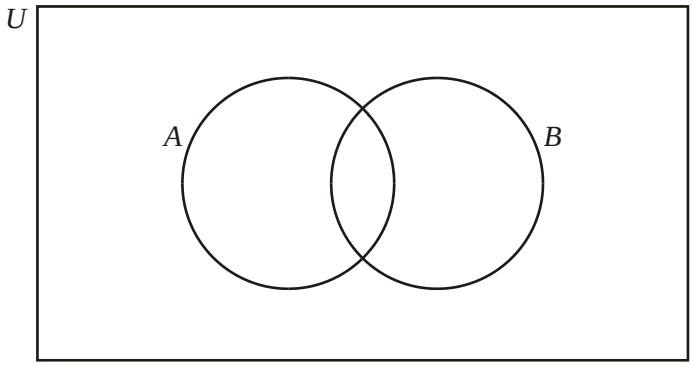
A = {integers that are multiples of 3}
B = {integers that are factors of 30}

(a) List the elements of

(i) A;

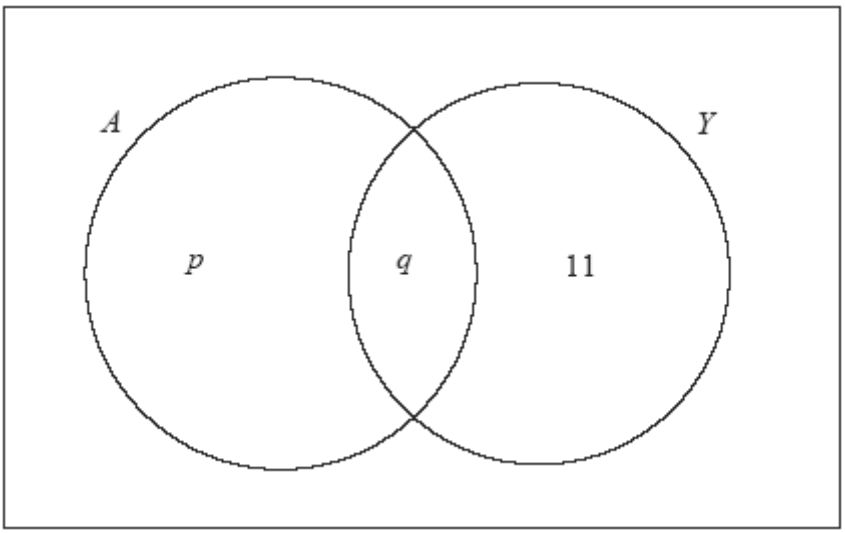
(ii) B.

(b) Place the elements of A and B in the appropriate region in the Venn diagram below.



(Total 4 marks)

6. A fitness club has 60 members. 35 of the members attend the club's aerobics course (A) and 28 members attend the club's yoga course (Y). 17 members attend both courses.
A Venn diagram is used to illustrate this situation.



(a) Write down the value of q.

(1)

(b) Find the value of p.

(2)

(c) Calculate the number of members of the fitness club who attend neither the aerobics course (A) nor the yoga course (Y).

(2)

(d) Shade, on your Venn diagram, $A' \cap Y$.

(1)
(Total 6 marks)