



**Maths
Junior Certificate
Higher Level**

**Past Exam Questions on
Sets**

Q2 Part (b) 2012 Paper 1

- (b) $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12\}$ is the universal set.
 $P = \{3, 5, 6, 8, 10\}$, $Q = \{2, 4, 6, 8, 10, 12\}$ and $R = \{2, 5, 6, 7, 9, 12\}$
are three subsets of U .

(i) Represent the above information on a Venn diagram.

Hence list the elements of:

(ii) $(P \cup Q \cup R)'$

(iii) $(P \cap Q) \setminus R$.

Q2 Part (c) 2011 Paper 1

- (c) U is the universal set and P and Q are two subsets of U .

$\#U = 30$, $\#P = 16$ and $\#Q = 6$.

(i) Find with the aid of a Venn diagram the minimum value of $\#(P \cup Q)'$.


(ii) Find with the aid of a Venn diagram the maximum value of $\#(P \cup Q)'$.

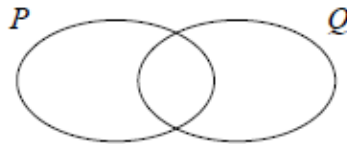
$\#U = u$, $\#P = p$, $\#Q = q$ and $\#(P \cup Q)' = x$.

(iii) Show with the aid of a Venn diagram, that if $p > q$ and x is a maximum,
then $u = p + x$.

Q2 Part (a) 2010 Paper 1

2. (a) P is the set of divisors of 12. Q is the set of divisors of 9.

 Using this information copy and complete the Venn diagram.



Q2 Part (b) 2010 Paper 1

- (b) A group of 100 students were asked if they had a presence on particular social networking websites A , B and C .



24 students had a presence on A only, 40 had a presence on B and 50 had a presence on C .

14 students had a presence on A and B but not on C .

18 students had a presence on A and C but not on B .

8 students had a presence on B and C but not on A .

4 students stated that they did not have a presence on any of the websites.

- (i)  Using x to represent the number of students who had a presence on all three websites, construct a Venn diagram and solve for x .
- (ii)  Hence, calculate the ratio of students with a presence on B only to the students with a presence on C only.



Q2 Part (b) 2009 Paper 1

- (b) A group of 49 students was asked which fruit each liked.
28 said they liked apples. 25 said they liked pears while 26 said they liked oranges.
8 said they liked all three types of fruit.
17 said they liked pears and oranges. 11 said they liked apples and oranges.
5 said they did not like any of the three types of fruit.
Let x represent those students who liked apples and pears but not oranges.
- (i) ✍ Represent the above information on a Venn diagram.
 - (ii) ✍ Calculate the value of x .
 - (iii) ✍ Calculate the percentage of students who liked one type of fruit only.
Give your answer correct to the nearest whole number.




Q2 Part (a) 2008 Paper 1

2. (a) A is the set of prime numbers less than 13.
(i) List the elements of the set A.
 $B = \{1, 3, 5, 7, 9, 11\}$.
(ii) Write down the elements of the set $B \setminus A$.

Q2 Part (c) 2007 Paper 1

- (c) A survey of 40 students was carried out to find how many owned an MP3 player, a digital camera or a CD player.
- 1 student does not own any of these.
- x students own all three, while $2x$ own an MP3 player and a digital camera but not a CD player.
- 10 own an MP3 player and a CD player, while 11 own a digital camera and a CD player.
- 22 own an MP3 player, 22 own a digital camera and 24 own a CD player.
- (i) ✍ Construct a Venn diagram and solve for x .
- (ii) ✍ Hence, calculate the percentage of students who own one item only.

Q2 Part (b) 2006 Paper 1

- (b) 70 teenagers responded to a survey about holiday destinations.
- 30 had travelled to France,
- 26 had travelled to Spain
- and 28 had travelled to Italy.
- 12 had travelled to both France and Spain,
- 8 had travelled to both Spain and Italy,
- while x had travelled to France and Italy only.
- 4 teenagers had travelled to all three countries.
- Twice as many had never travelled to any of these destinations as had travelled to France and Italy only.
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- (i) ✍ Represent the above information on a Venn diagram.
- (ii) ✍ Find the number of teenagers who had travelled to France only.

Q5 Part (b) 2005 Paper 1

- (b) In a school of 430 students, 250 students study History, 240 students study Geography.

Let x represent the number of students who study neither History nor Geography.

The number of students who study both History and Geography is 3 times the number who study neither of these subjects.

- (i) ✍ Represent this information on a Venn diagram.
- (ii) ✍ Write down and simplify an expression in x for the total number of students in the school.
- (iii) ✍ Use this expression to find the number of students who study neither History nor Geography.

Q1 Part (a) 2005 Paper 1

1. (a) ✍ U is the universal set. P and Q are two subsets of U .
Copy the Venn diagram into your answerbook and shade in the set $(P \cup Q)'$.

