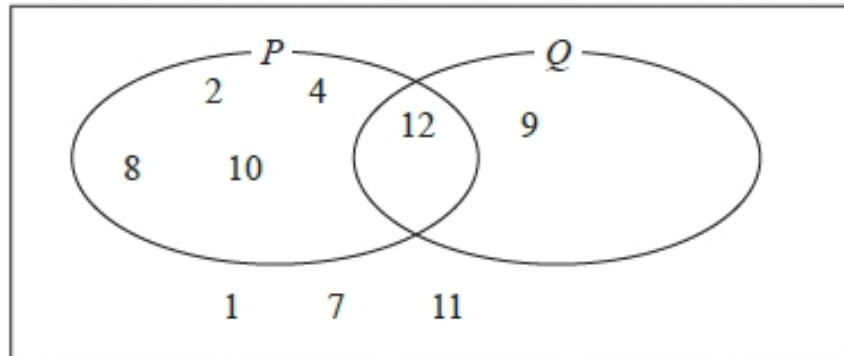


## S145 Venn diagrams 1

Q1.

The numbers 1, 2, 4, 7, 8, 9, 10, 11 and 12 are put into a Venn diagram.



The number 3 is in set Q but not in set P.

The number 6 is in both set P and set Q.

(a) Complete the Venn diagram.

(2)

A student chooses at random a number in the completed Venn diagram.

(b) Write down the probability that this number is **not** in Set Q.

.....  
(2)

**(Total for question = 4 marks)**

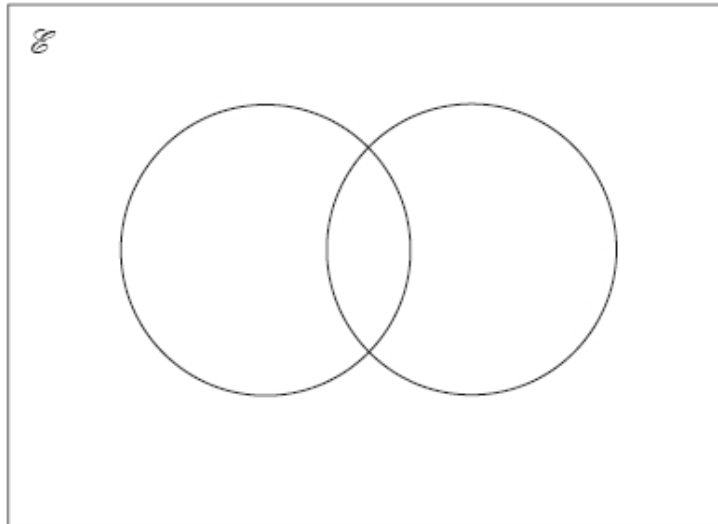
**Q2.**

$\mathcal{E}$  = odd numbers less than 30

$A = 3, 9, 15, 21, 27$

$B = 5, 15, 25$

(a) Complete the Venn diagram to represent this information.



(4)

A number is chosen at random from the universal set,  $\mathcal{E}$ .

(b) What is the probability that the number is in the set  $A \cup B$ ?

.....  
(2)

**(Total for question = 6 marks)**

**Q3.**

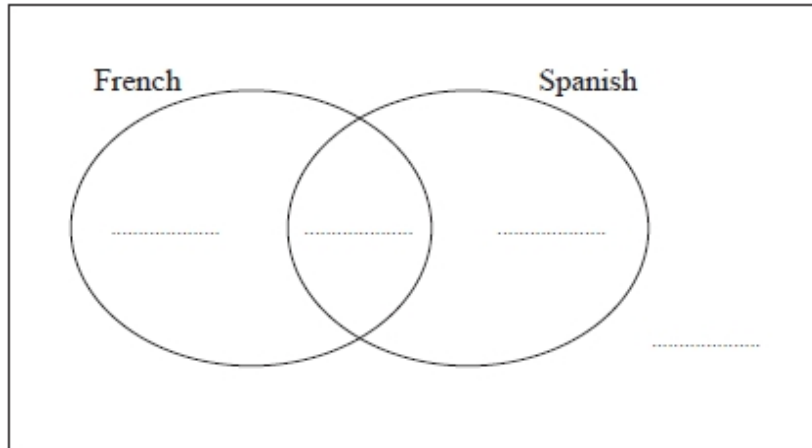
There are 60 students at a college.

20 students study both French and Spanish.

13 students study French but not Spanish.

A total of 43 students study Spanish.

(a) Complete the Venn diagram for this information.



(3)

One of the students at the college is to be selected at random.

(b) Write down the probability that this student studies neither French nor Spanish.

.....  
(1)

**(Total for question = 4 marks)**

**Q4.**

$$\mathcal{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$$

$$A = \{\text{multiples of 2}\}$$

$$A \cap B = \{2, 6\}$$

$$A \cup B = \{1, 2, 3, 4, 6, 8, 9, 10\}$$

Draw a Venn diagram for this information.

**(Total for question is 4 marks)**

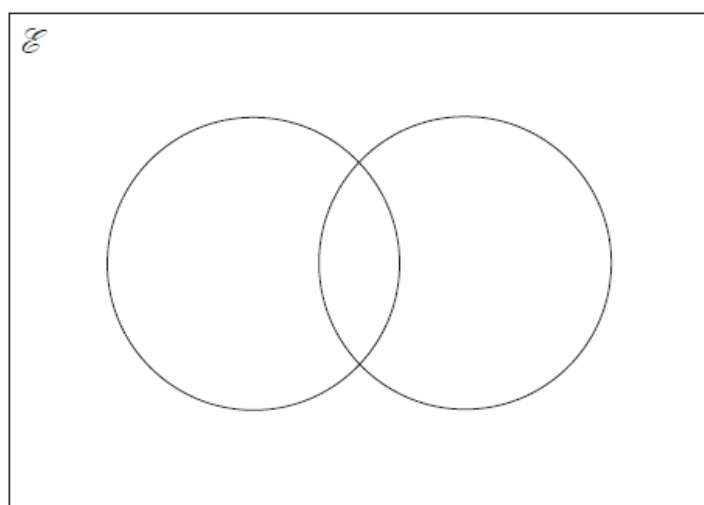
**Q5.**

$$\mathcal{E} = 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13$$

$$A = \text{multiples of 3}$$

$$B = \text{even numbers}$$

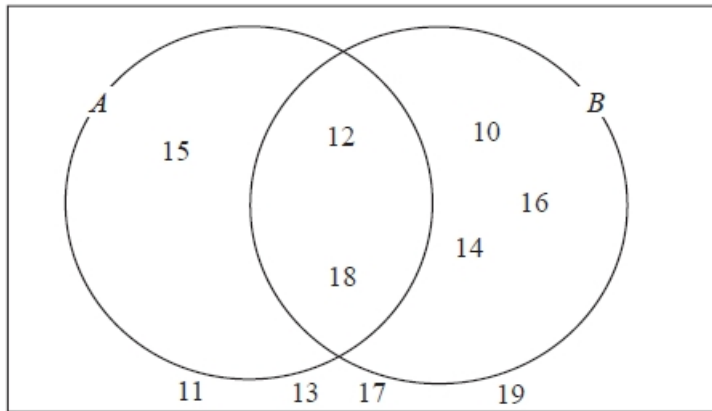
Complete the Venn diagram for this information.



**(Total for question = 4 marks)**

**Q6.**

Here is a Venn diagram.



(a) Write down the numbers that are in set

(i)  $A \cup B$

.....

(ii)  $A \cap B$

.....

(2)

One of the numbers in the diagram is chosen at random.

(b) Find the probability that the number is in set  $A'$

.....

(2)

**(Total for question = 4 marks)**

**Q7.**

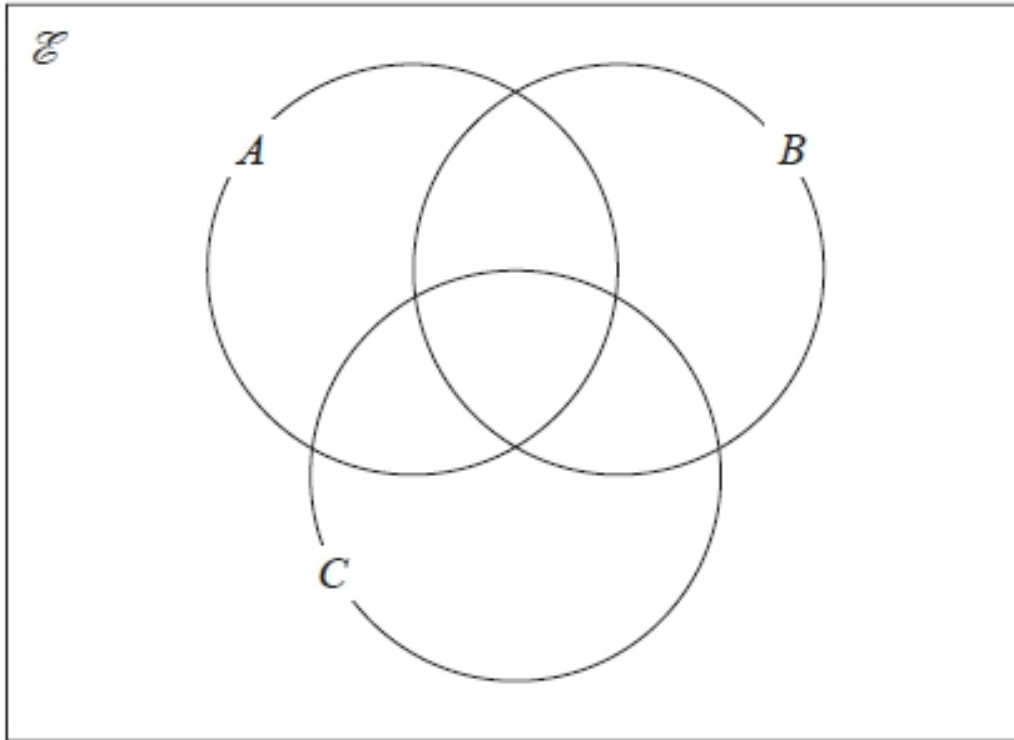
$\mathcal{E}$  = even numbers between 1 and 25

$A = 2, 8, 10, 14$

$B = 6, 8, 20$

$C = 8, 18, 20, 22$

(a) Complete the Venn diagram for this information.



(4)

A number is chosen at random from  $\mathcal{E}$ .

(b) Find the probability that the number is a member of  $A \cap B$ .

.....  
(2)

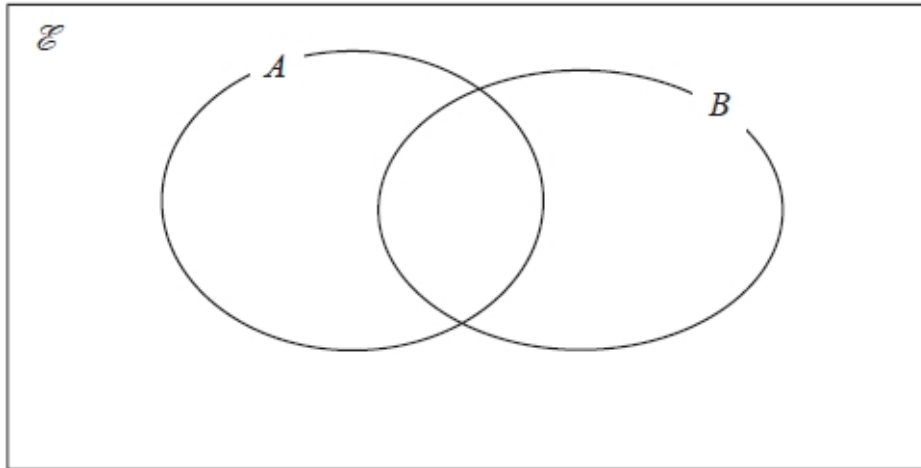
**(Total for question = 6 marks)**

**Q8.**

$$\mathcal{E} = 1, 2, 3, 4, 5, 6, 7, 8, 9$$

$$A = 1, 5, 6, 8, 9$$

$$B = 2, 6, 9$$



(a) Complete the Venn diagram to represent this information.

(3)

A number is chosen at random from the universal set  $\mathcal{E}$ .

(b) Find the probability that the number is in the set  $A \cap B$

.....  
(2)

**(Total for question = 5 marks)**

**Q9.**

50 people were asked if they speak French or German or Spanish.

Of these people,

31 speak French

2 speak French, German and Spanish

4 speak French and Spanish but not German

7 speak German and Spanish

8 do not speak any of the languages all

10 people who speak German speak at least one other language

Two of the 50 people are chosen at random.

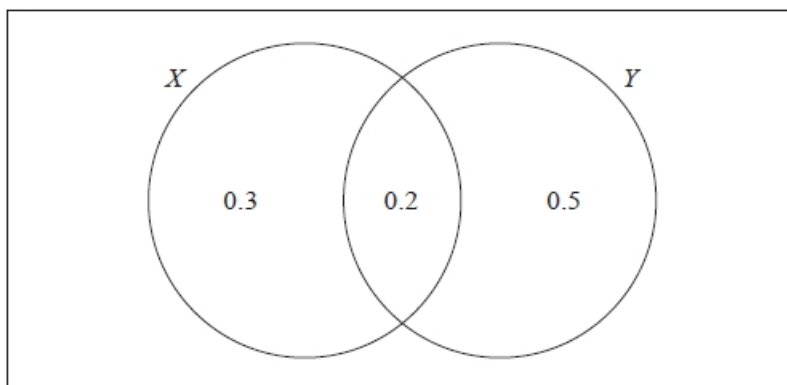
Work out the probability that they both only speak Spanish.

.....  
**(Total for question = 5 marks)**



**Q10.**

The Venn diagram shows probabilities relating to two events,  $X$  and  $Y$ .



(a) Explain whether or not  $X$  and  $Y$  are exhaustive events.

(1)

(b) (i) Work out  $P(X) \times P(Y)$ .

(ii) Explain why the events  $X$  and  $Y$  are **not** independent.

(3)

Two different events,  $A$  and  $B$ , are such that

$$P(A) = 0.6$$

$$P(B) = 0.5$$

$$P(A \cap B) = 0.25$$

(c) Find  $P(A \cup B)$ .

(2)

**(Total for question = 6 marks)**