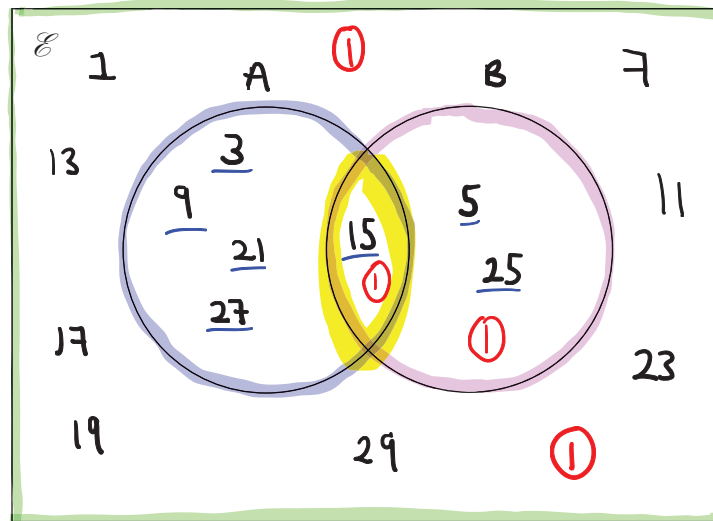


1.  $\mathcal{E} = \{\text{odd numbers less than } 30\}$   
 $A = \{\cancel{3}, \cancel{9}, 15, \cancel{21}, \cancel{27}\}$   
 $B = \{\cancel{5}, 15, \cancel{25}\}$

(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  $A \cup B$ ?

$$\frac{7}{15}$$

$$\frac{7}{15}$$

(2)

(Total for Question is 6 marks)

2. 50 people were asked if they speak French or German or Spanish.

Of these people,

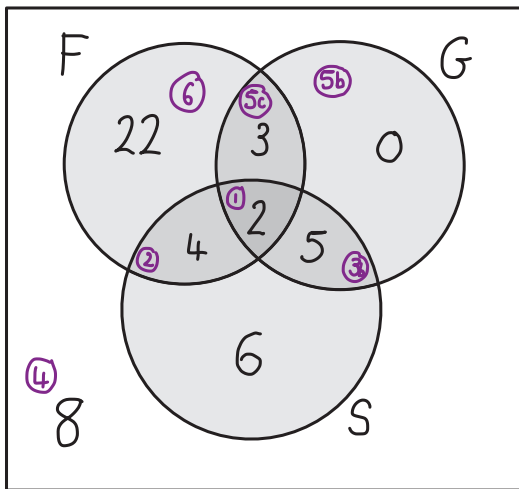
- ⑥ 31 speak French
- ① 2 speak French, German and Spanish
- ② 4 speak French and Spanish but not German
- ③ 7 speak German and Spanish
- ④ 8 do not speak any of the languages
- ⑤ all 10 people who speak German speak at least one other language

Work through these in order adding values to the venn diagram

Use this point last (need more values in the venn diagram for it to be useful)

Two of the 50 people are chosen at random.

Work out the probability that they both only speak Spanish.



① Venn diagram with 1 unknown

③ 7 speak G and S

$7 - 2 = 5$  5 speak G and S but not F

① Finding 3 unknowns

⑤ 10 speak G

0 speak only G (5b)

⑤c  $10 - 2 - 5 = 3$

⑥ only F =  $31 - 3 - 2 - 4 = 22$

Only S = Total - all already in venn diagram  
 $= 50 - 22 - 3 - 2 - 4 - 5 - 8 = 6$  ①

Probability of both

$= \frac{6}{50} \times \frac{5}{49}$  ①

$= \frac{6}{490}$

Probability the first random person only speaks Spanish :

$\frac{6}{50}$

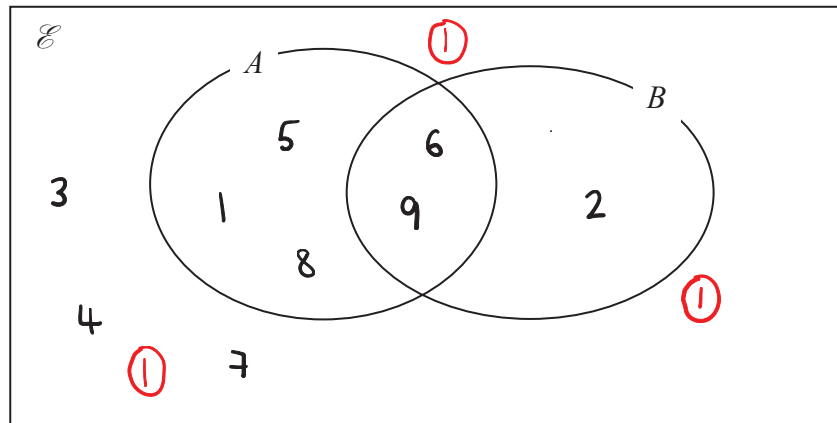
$\frac{6}{490}$  ①

Probability the second person does (the first cannot be chosen again)

$\frac{6-1}{50-1} = \frac{5}{49}$

(Total for Question is 5 marks)

3.  $\mathcal{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$  universal set  
 $A = \{1, 5, 6, 8, 9\}$   
 $B = \{2, 6, 9\}$



- (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 numbers in set A and set B.

9 numbers in total. ①

$$P(A \cap B) = \frac{2}{9}$$

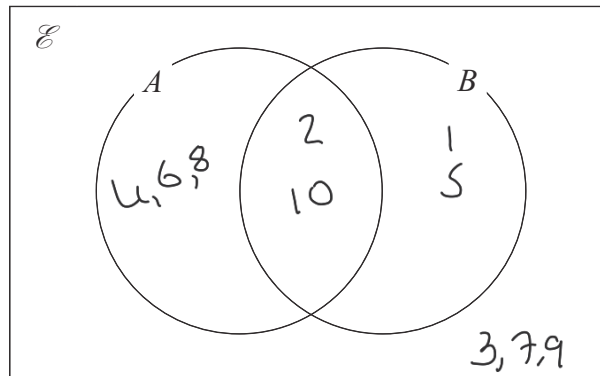
①  $\frac{2}{9}$

(2)

(Total for Question is 5 marks)

4.  $\mathcal{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$   
 $A = \{\text{even numbers}\}$   
 $B = \{\text{factors of } 10\}$

(a) Complete the Venn diagram for this information.



✓<sub>1</sub> ✓<sub>2</sub> ✓<sub>3</sub>

(3)

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

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

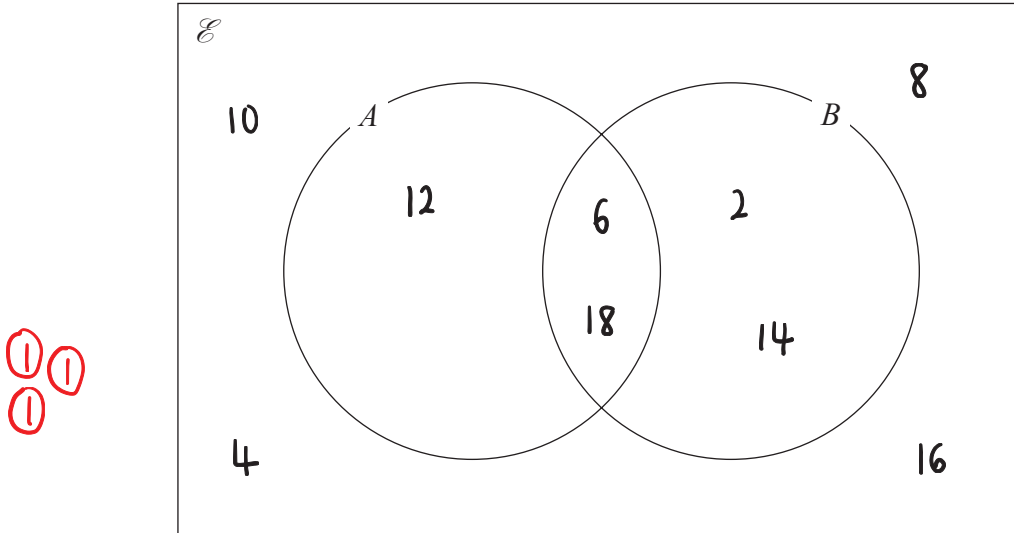
$\frac{2}{10}$  ✓<sub>1</sub> ✓<sub>2</sub>

.....  
(2)

(Total for Question is 5 marks)

5.  $E = \{\text{even numbers less than 19}\}$   $= \{2, 4, 6, 8, 10, 12, 14, 16, 18\}$   
 $A = \{6, 12, 18\}$   
 $B = \{2, 6, 14, 18\}$

Complete the Venn diagram for this information.



(Total for Question is 3 marks)