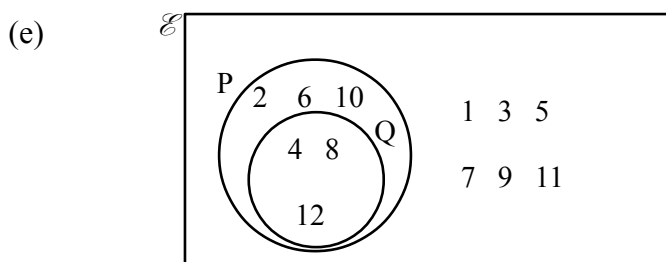
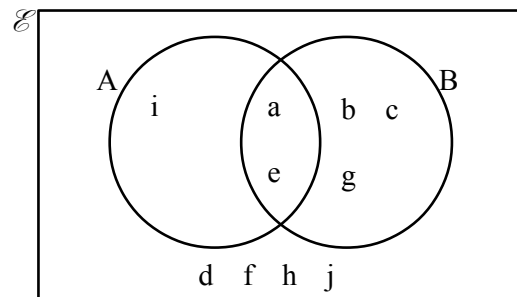
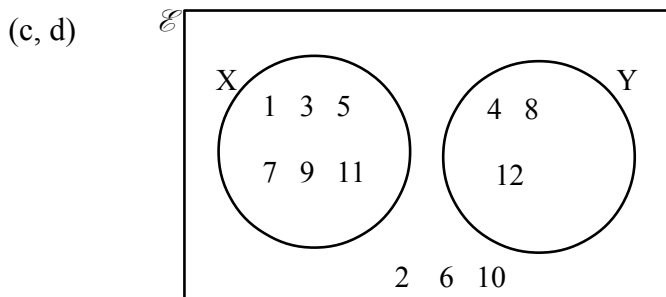
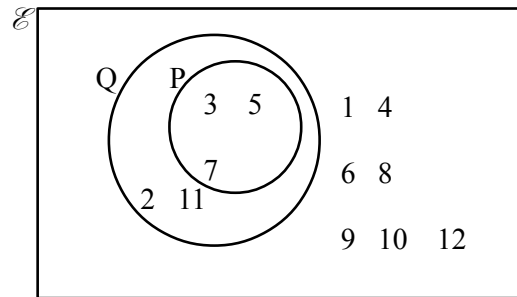
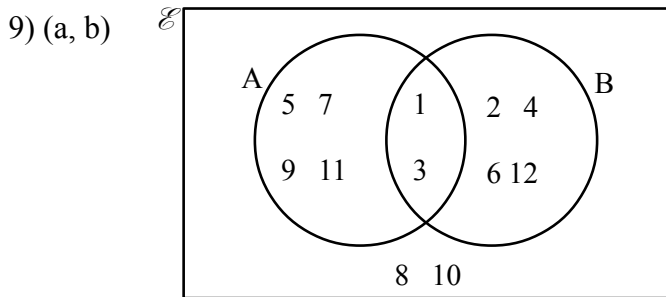


## Sets and Set Notation – Answers

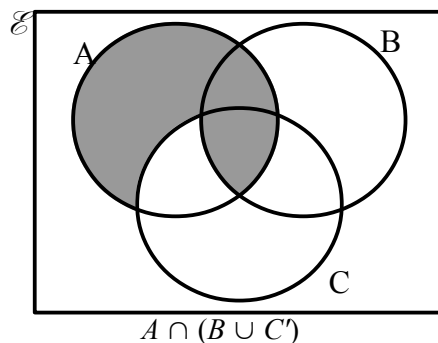
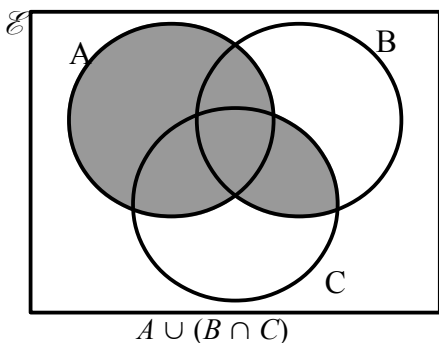
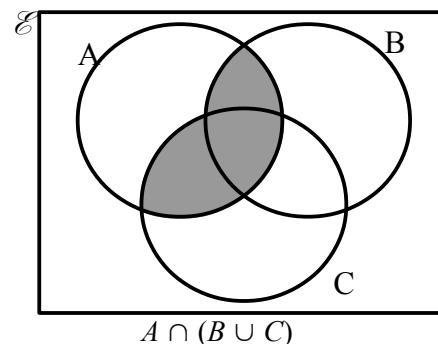
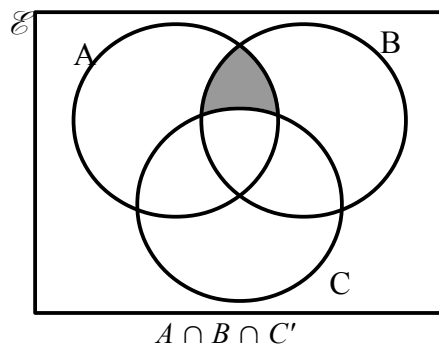
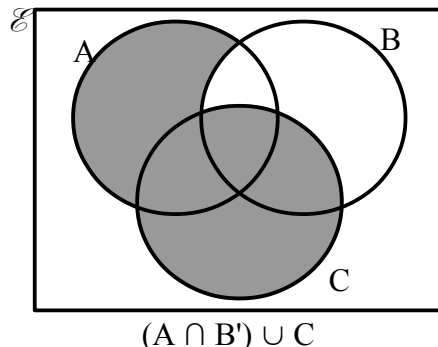
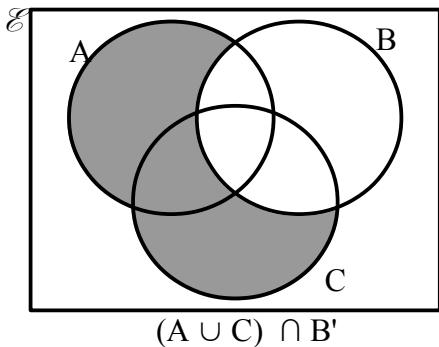
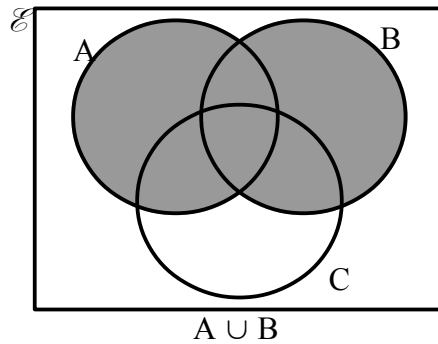
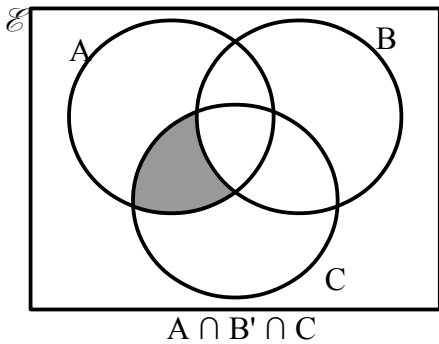
### Sets

- 1)  $A = \{1, 3, 5, 7, 9, 11, 13, 15\}$   
 $B = \{\text{London, Cardiff, Edinburgh, Belfast}\}$   
 $C = \{1, 2, 3, 4, 6, 8, 12, 24\}$
- 2)  $X = \{\text{squares of integers from 1 to 9 inclusive}\}$   
 $Y = \{\text{members of the Beatles}\}$   
 $Z = \{\text{even numbers from 12 to 18 inclusive}\}$
- 3) (a)  $n(A) = 8$ ,  $n(B) = 4$ ,  $n(C) = 8$  (b) Yes (c) No
- 4) (a)  $7 \in Q$  (b)  $7 \notin P$  (c)  $7 \in R$  (d)  $13 \notin Q$  (e)  $13 \in R$  (f)  $99 \in P$
- 5) (a) Yes (b) Yes (c) No
- 6) (a) T (b) F (c) F (d) T  
 (e) T (f) T (g) T (h) F
- 7) (a)  $\emptyset$ ,  $\{a\}$ ,  $\{b\}$ ,  $\{c\}$ ,  $\{a, b\}$ ,  $\{a, c\}$ ,  $\{b, c\}$ ,  $\{a, b, c\}$   
 (b)  $\emptyset$ ,  $\{a\}$ ,  $\{b\}$ ,  $\{a, b\}$   
 (c)  $\emptyset$ ,  $\{a\}$   
 (d)  $\emptyset$   
 (e) A set with  $n$  elements, has  $2^n$  subsets. (Each extra element doubles the number of subsets.)  
 (f) 16 subsets
- 8) (a)  $C = \{2, 4, 6, 8, 10, 12, 14, 16, 18\}$  (b)  $D = \{2, 3, 5, 7, 11, 13, 17, 19\}$   
 (c)  $\{2, 4\}$  (d)  $\{2, 3, 5\}$  (e)  $\{1, 3, 5\}$  (f)  $\emptyset$  (g)  $\{2\}$   
 (h)  $A \cap B = B$ , because  $B \subset A$



### Venn diagram questions – 3 circles

In each diagram, shade the required area.

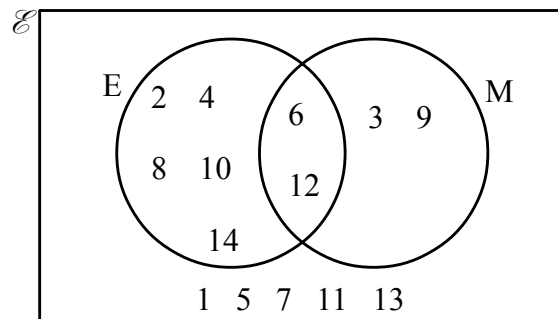


## Set Language and Notation

- 1) (a)  $\{2,4,6,8\}$   
 (b)  $\{1,2,3,6,9,18\}$   
 (c)  $\{\text{May, June, July, August}\}$   
 (d)  $\{0,1,4,9,16,25,36,49,64,81\}$
- 2) (a) (i)  $\{4, 8, 12, 16\}$                       (ii)  $\{11, 12, 13, 14, 15, 16, 17\}$                       (iii)  $\{12, 16\}$   
 (b)  $\emptyset$  (empty set)
- 3) (a) Paperback mathematics books                      (b) Books about maths and travel (maybe  $\emptyset$  ?)  
 (c) It is either about maths or about travel (or possibly both).
- 4) (a) Isosceles triangles                      (b) (i) False                      (ii) True                      (iii) True
- 5) (a) (i)  $\{1, 3, 5, 6, 7, 9, 12, 15, 18\}$                       (ii)  $\{3, 9\}$   
 (b)  $\{3, 5, 7\}$                       (c) True: no multiple of 3 can be prime (except 3 itself)
- 6) (i)  $\{1, 4, 6, 12\}$                       (ii)  $\{5, 7, 11\}$                       (iii)  $\{1, 2, 3, 4, 5, 6, 7, 11, 12\}$
- 7) (a)  $\{1, 3, 5, 7\}$                       (b) 11                      (c)  $A \cap B \cap C = \emptyset$   
 (d) Not true:  $1 \in A \cap C'$ , but  $1 \notin B$

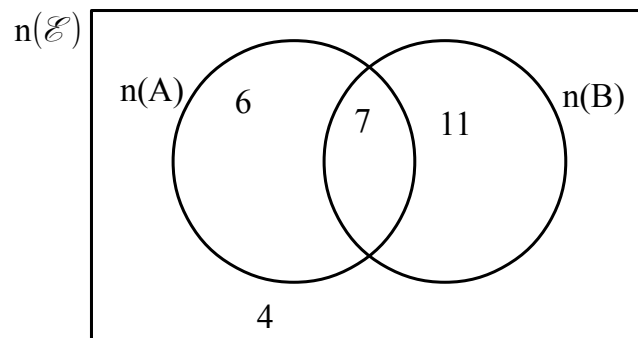
8) (a)

(b) 5



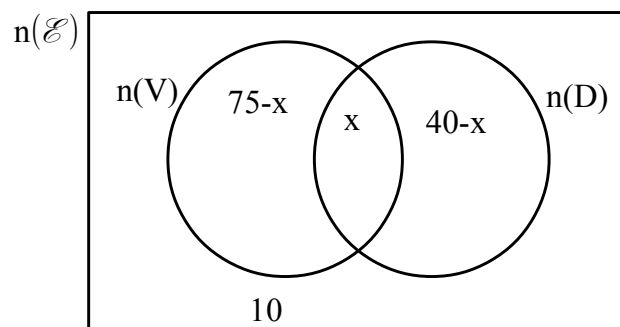
9) (a)

(b) 4



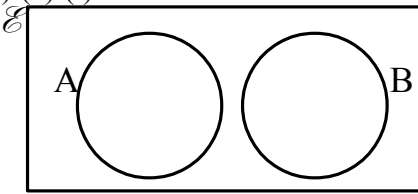
10)

$x = 35$

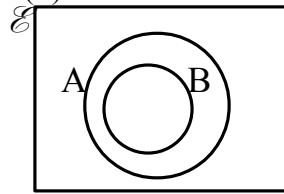


11) 14 people

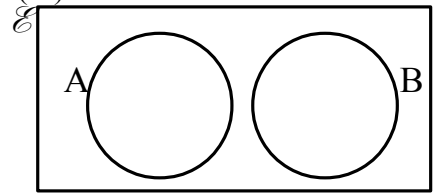
12) (a) (i)  $A \cap B = \emptyset$



(ii)  $A \cap B = B$



(iii)  $A \cap B' = A$



(b)  $A \cap B = \emptyset$  and  $A \cap B' = A$

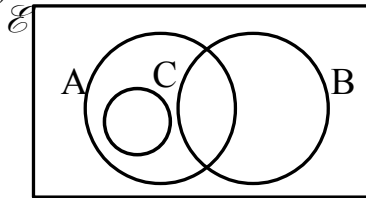
(c) (i)  $B \subset A$

(iii)  $A \subset B'$

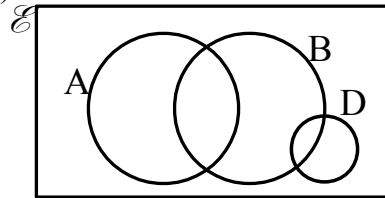
13) See last 4 questions on previous worksheet

14)

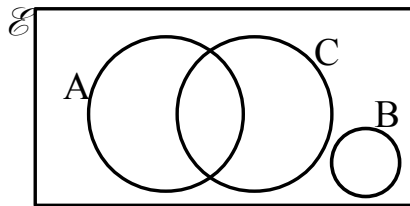
(a)



(b)

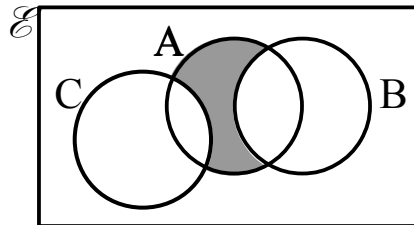


15)



16) (a) 2

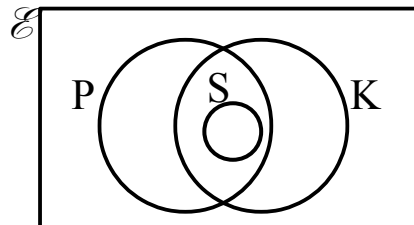
(b) (iii) {6, 18}



17) (a) Rhombus

(b)  $P \cup S = P$

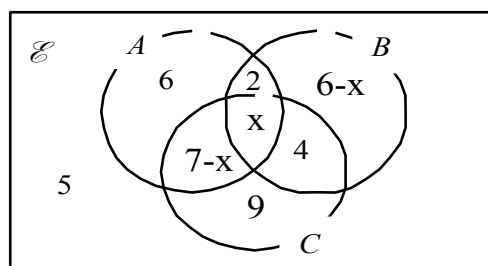
(c)



18)  $(A \cup B) \cap C'$

19) (a)

(b)  $x = 4$



20) (a) 4

(b) 1

21) 6