

3.4 Answers

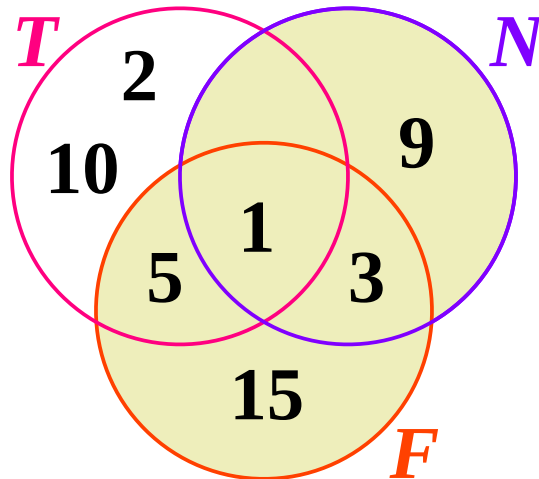
3.4.1 Solution to 3.2 Example

$$T = \{\text{Factors of } 10\} = \{1, 2, 5, 10\}$$

$$N = \{\text{Factors of } 9\} = \{1, 3, 9\}$$

$$F = \{\text{Factors of } 15\} = \{1, 3, 5, 15\}$$

(i), (ii)



[3, 1 marks]

(iii) $N \cup F = \{1, 3, 5, 9, 15\}$

[1 mark]

(iv) $n(N \cup F) = 5$

[1 mark]

3.4.2 Solutions to 3.3 Exercise

Answer 1

(i) $T = \{1, 2, 11, 22\}$

[1 mark]

(ii) $n\{\text{factors of } 22\} = 4$

[1 mark]

Answer 2

(a) The 35 in the Venn diagram is the number of people at the nightclub who like pop music but do not like techno or drum & bass music.

[1 mark]

(b) (i) $n\{\text{people who like **Pop** music}\} = 35 + 5 + 2 + 1$
 $= 43$

[1 mark]

(ii) $n\{\text{people who like **Techo** music}\} = 11 + 4 + 5 + 2$
 $= 22$

[1 mark]

(iii) $n(D) = 5 + 11 + 2 + 1$
 $= 19$

[1 mark]

(iv) $n(P \cap D) = 2 + 1$
 $= 3$

[1 mark]

(v) $n(P \cup D) = 35 + 5 + 2 + 1 + 5 + 11$
 $= 59$

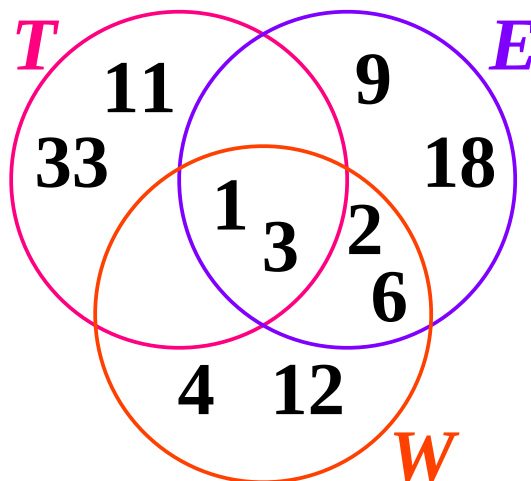
[1 mark]

Answer 3

- (a) $T = \{1, 3, 11, 33\}$
 $E = \{1, 2, 3, 6, 9, 18\}$
 $W = \{1, 2, 3, 4, 6, 12\}$

[3 marks]

(b)



[3 marks]

- (c) (i) $n(T) = 4$ (ii) $n(E) = 6$
 (iii) $n(T \cap E) = 2$ (iv) $n(T \cup E) = 8$
 (v) $n(E \cap W) = 4$ (vi) $n(E \cup W) = 8$
 (vii) $n(T \cap E \cap W) = 2$ (viii) $n(T \cup E \cup W) = 10$

[8 marks]

- (d) Does $n(T) + n(E) = n(T \cup E)$? No !

[1 mark]

- (e) $hcf\{33, 18, 12\} = 3$

[1 mark]

Answer 4

- (i) A (ii) $A \cup B$
 (iii) $(A \cup B)'$ (iv) B'
 (v) $A \cap B$ (vi) $A \cap B'$

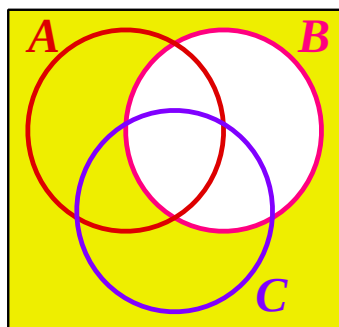
[6 marks]

Answer 5

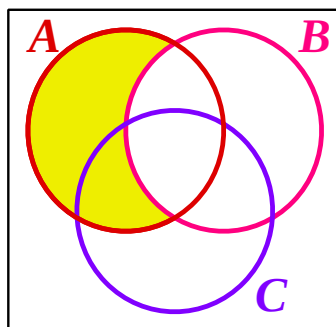
- (i) T (ii) F (iii) T (iv) F (v) F

[5 marks]

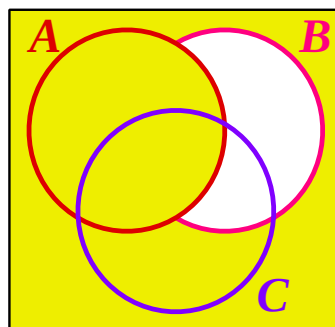
Answer 6



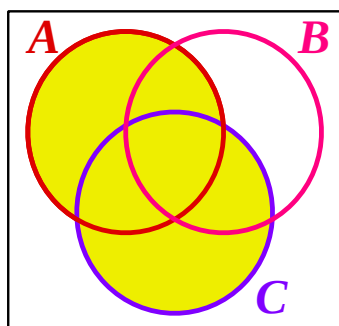
Shade : B'



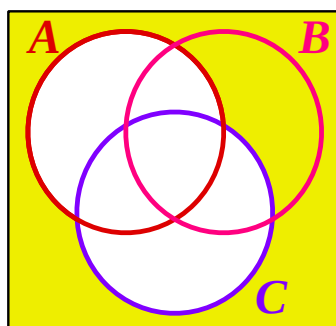
Shade : $A \cap B'$



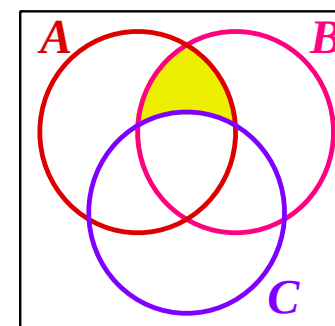
Shade : $A \cup B'$



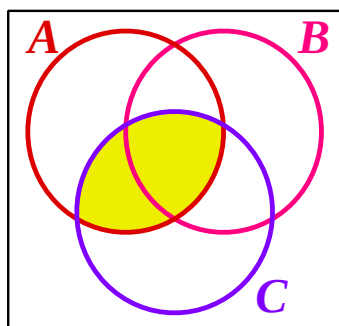
Shade : $A \cup C$



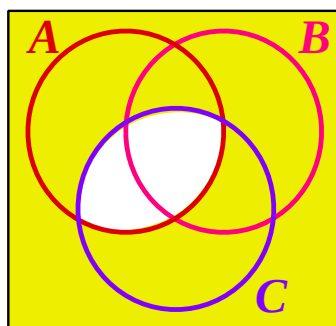
Shade : $(A \cup C)'$



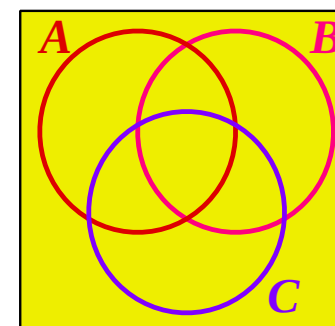
Shade : $A \cap B \cap C'$



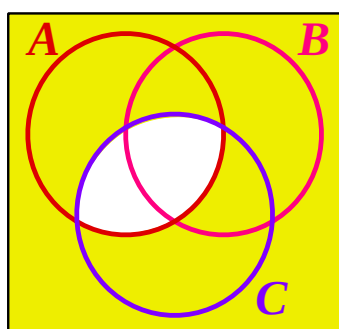
Shade : $A \cap C$



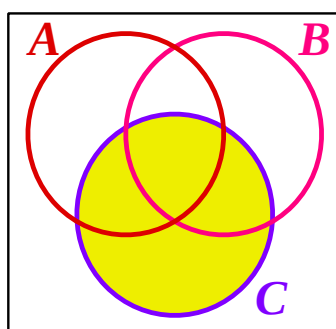
Shade : $(A \cap C)'$



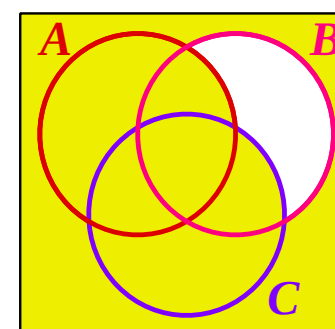
Shade : $B \cup B'$



Shade : $A' \cup C'$



Shade : $C \cap C$



Shade : $C \cup A \cup B'$

[12 marks]

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Teachers may obtain detailed worked solutions to the exercises by email from mhh@shrewsbury.org.uk