

Year 10 Maths Feast 2015

Entrée: Comprehension Round on Set Theory (30 marks)

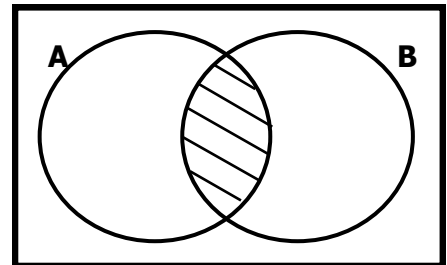
1. Given $A = \{1, 2, 4, 8, 16\}$, $B = \{2, 4, 6, 8, 10, 12\}$ and $\mathcal{E} = \{1, 2, 3, 4, \dots, 20\}$

$n(A) =$ (2 marks) $A \cap B =$ (2 marks, 1 mark if only one error)

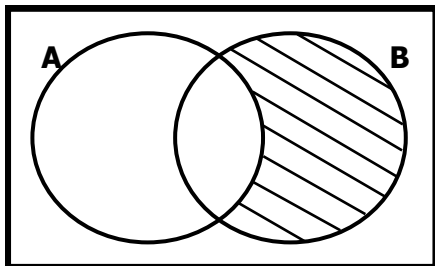
$n(A \cup B^c) =$ (2 marks) $A \cup B =$ (2 marks, 1 mark if only one error)

$A^c \cap B =$ (2 marks, 1 mark if only one error)

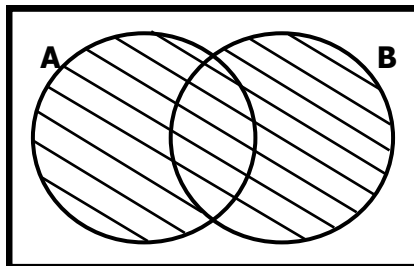
2. The shaded region on the Venn diagram shows $A \cap B$.



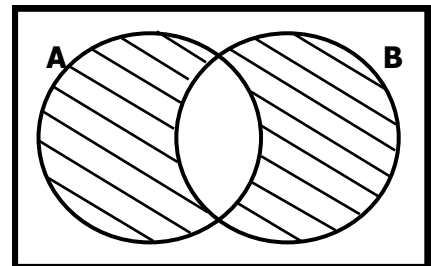
For each diagram below, write down the description for each shaded area.



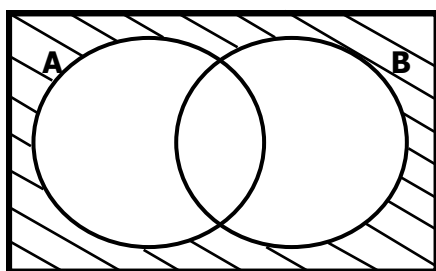
$A^c \cap B$ (2 marks)



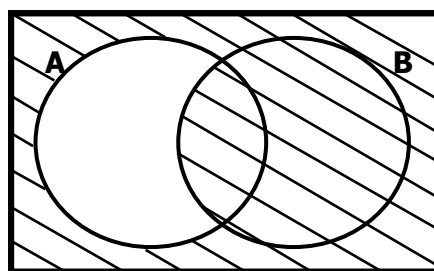
$A \cup B$ (2 marks)



$(A \cap B)^c \cap (A \cup B)$
or $(A^c \cap B) \cup (A \cap B^c)$ (2 marks)



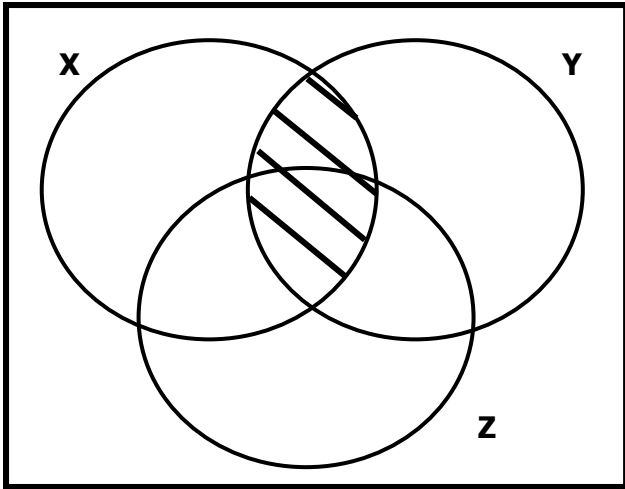
$(A \cup B)^c$
or $A^c \cap B^c$ (2 marks)



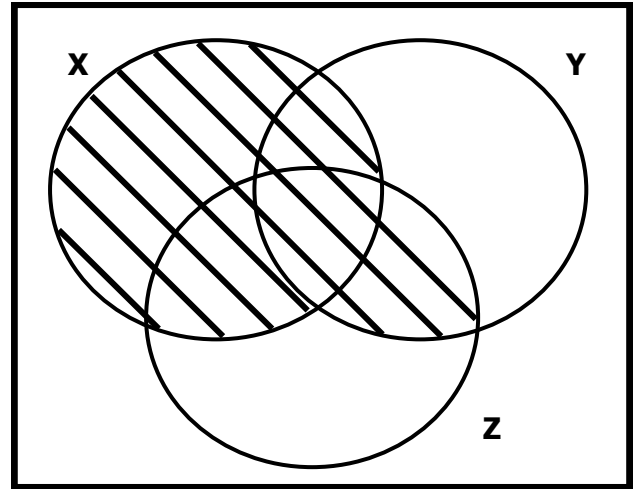
$A^c \cap B$
or $(A \cap B^c)^c$ (2 marks)



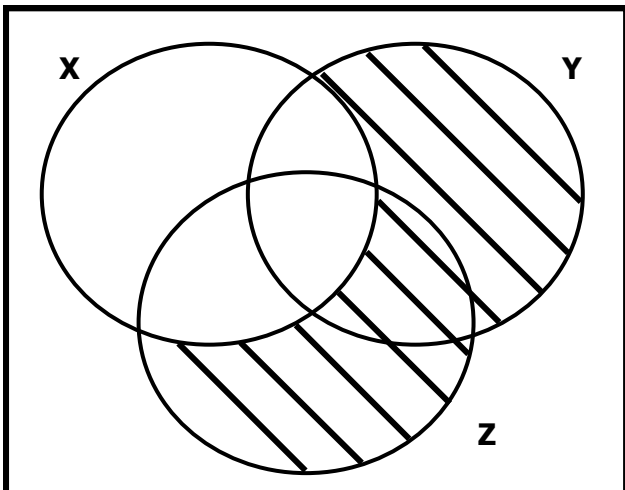
3. Shade each diagram to show the region described by the statement underneath the diagram:



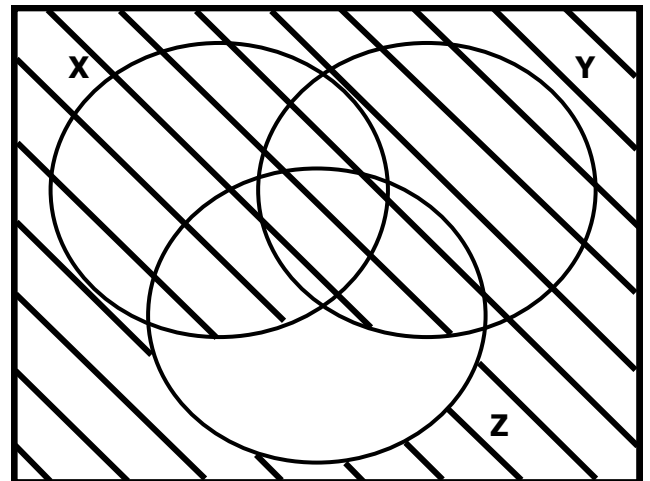
$X \cap Y$ (2 marks)



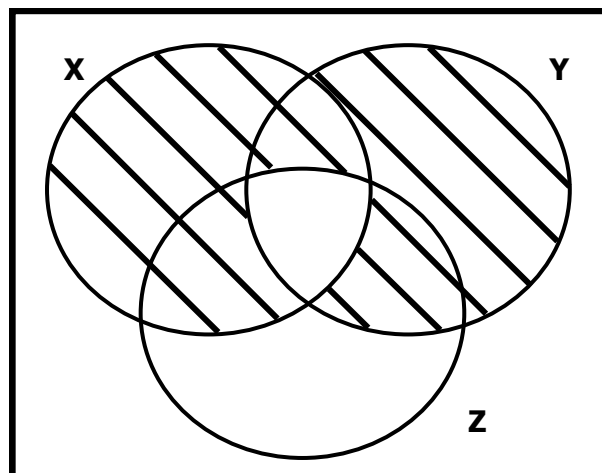
$X \cup (Y \cap Z)$ (2 marks)



$X^c \cap (Y \cup Z)$ (2 marks)



$X \cup Y \cup Z^c$ (2 marks)



$(X \cap Y^c) \cup (Y \cap X^c) \cup (Z^c \cap X \cap Y)$ (2 marks)