
If $A = \{2, 5, 7, 8\}$, $B = \{3, 6, 7, 8\}$, $C = \{1, 4, 5\}$, and $U = \{1, 2, 3, \dots, 8\}$, find each of the following.

1. Find C' 2. Find $A \cup B$ 3. Find $A' \cap C$ 4. Write $|U|$ 5. Write $A \oplus C$ 6. Find $A - B$ 7. Find $B - C$ 8. Find $|C'|$

What can be said about sets A and B if each of the following is true? Think about all possibilities!

9. $A \cup B = A$ 10. $A \cap B = A$ 11. $A - B = A$ 12. $A - B = B - A$ 13. $A \cup \emptyset = B$ 14. $A \cap \emptyset = B$

Multisets

Let $A = \{3 \cdot a, 4 \cdot b, 1 \cdot c\}$ and $B = \{2 \cdot a, 2 \cdot b, 4 \cdot c\}$. Find each of the following:

15. $A \cup B$

16. $A \cap B$

17. $A - B$

18. $B - A$

19. $A + B$

20. $|A|$

Suppose that the math department and the science department are ordering technology. Let M be the multiset that the math department needs, $M = \{8 \cdot \text{computers}, 6 \cdot \text{monitors}, 5 \cdot \text{printers}, 105 \cdot \text{calculators}\}$. Let S be the multiset that the science department needs, $S = \{5 \cdot \text{computers}, 5 \cdot \text{monitors}, 7 \cdot \text{printers}, 4 \cdot \text{scanners}\}$.

21. What combination of M and S represents the equipment that should be purchased assuming both departments share equipment?

22. What combination of M and S represents the equipment that the departments will share?

23. What combination of M and S represents the equipment that, if they share, can still be housed in the math department, because the science department won't need it?

24. What combination of M and S represents the equipment that should be purchased if the departments don't share equipment?