

9.1 Sets and Conditional Probability

- Onlin
- Hints
- Extra

Set A is the set of factors of 12, set B is the set of even natural numbers less than 13, set C is the set of odd natural numbers less than 13, set D is the set of even natural numbers less than 7. The universal set for these questions is the set of natural numbers less than 13.

$$\text{So } A = \{1, 2, 3, 4, 6, 12\}, B = \{2, 4, 6, 8, 10, 12\},$$

$$C = \{1, 3, 5, 7, 9, 11\}, D = \{2, 4, 6\}, \text{ and}$$

$$U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12\}. \text{ Answer each question.}$$

1. Is $D \subset A$? Explain why or why not.
2. Is $B \subset A$? Explain why or why not.
3. What is $A \cap B$?
4. What is $A \cap C$?
5. What is $A \cup B$?
6. What is $A \cup C$?
7. What is A^c ?
8. What is B^c ?

You have a set of 10 cards numbered 1 to 10. You choose a card at random. Event A is choosing a number less than 7. Event B is choosing an odd number. Calculate the probability.

9. $P(A)$
10. $P(B)$
11. $P(A \cup B)$
12. $P(A \cap B)$
13. $P(A^c)$
14. $P(B^c)$

Draw a Venn diagram for each situation. Make sure everything is contained within a representation of the universal set.

15. $A \cup B$

16. $A \cap B$

17. A^c

18. $(A \cap B)^c$

19. $A \subset B$

20. $A \cap B \cap C$