



MATHS

BOOKS - MAXIMUM PUBLICATION

SETS

Example

1. Write the following sets in roster form.

$$B = \{x : x \in N, x \leq 6\}$$



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2. Write the following sets in roster form.

$$C = \{x : x \text{ is a vowel in english alphabet}\}$$



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3. Write the following sets in roster form.

$$D = \{x : x \text{ is a two digit natural number such that the sum of its digits is } 8\}$$



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4. Write the following sets in roster form.

$$E = \left\{ x : x \in Z, -\frac{1}{2} < x < \frac{9}{2} \right\}$$



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5. Write the following sets in Set builder form.

$$A = \{3, 6, 9, 12\}$$



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6. Write the following sets in Set builder form.

$$B = \{2, 4, 8, 16, 32\}$$



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7. Write the following sets in Set builder form.

$$C = \left\{ \frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{4}{5}, \frac{5}{6}, \frac{6}{7} \right\}$$



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8. Write the following sets in Set builder form.

$$D = \{5, 25, 125, 625\}$$



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9. Write the following sets in Set builder form.

$$E = \{2, 4, 6, \dots\}$$



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10. Write the following in interval form.

$$\{x : x \in R, -4 < x \leq 6\}$$



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11. Write the following in interval form.

$$\{x : x \in R, 0 \leq x < 7\}$$



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12. Write the following in interval form.

$$\{x : x \in R, 3 \leq x \leq 4\}$$



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13. Write the following in set builder form.

$$[0, 10]$$



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14. Write the following in set builder form.

$$[-2, 7]$$



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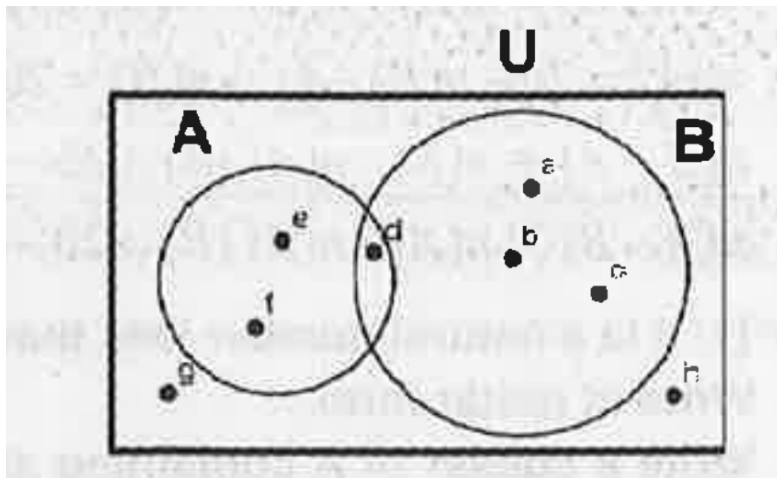
15. Write the following in set builder form.

$$[3, 4]$$



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16. Find set A, B and Universal set U.



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17. Write all subset of the following.

$\{1, 2\}$



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18. Write all subset of the following.

$\{a, b, c\}$



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19. Write all subset of the following.

\emptyset



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20. Let $A = \{1, 2, \{3, 4\}, s, d, \theta\}$, which of the following statements are true/false and why?

$$3 \in A$$



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21. Let $A = \{1, 2, \{3, 4\}, s, d, \theta\}$, which of the following statements are true/false and why?

$$\{1, \{3, 4\}\} \in A$$



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22. Let $A = \{1, 2, \{3, 4\}, s, d, \theta\}$, which of the following statements are true/false and why?

$$\{1, 2, 3\} \subset A$$



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23. Let $A = \{1, 2, \{3, 4\}, s, d, \theta\}$, which of the following statements are true/false and why?

$$\emptyset \in A$$



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24. Let $A = \{1, 2, \{3, 4\}, s, d, \theta\}$, which of the following statements are true/false and why?

$$1 \subset A$$



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25. If $A = \{1, 2, 4, 6, 7, 8\}$, $B = \{2, 5, 7, 9, 10\}$ and $C = \{4, 5, 9, 10\}$. Find

$$A \cup B$$



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26. If $A = \{1, 2, 4, 6, 7, 8\}$, $B = \{2, 5, 7, 9, 10\}$

and $C = \{4, 5, 9, 10\}$. Find

$$B \cup C$$



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27. If $A = \{1, 2, 4, 6, 7, 8\}$, $B = \{2, 5, 7, 9, 10\}$

and $C = \{4, 5, 9, 10\}$. Find

$$A \cup C$$



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28. If $A = \{1, 2, 4, 6, 7, 8\}$, $B = \{2, 5, 7, 9, 10\}$

and $C = \{4, 5, 9, 10\}$. Find

$$A \cap B$$



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29. If $A = \{1, 2, 4, 6, 7, 8\}$, $B = \{2, 5, 7, 9, 10\}$

and $C = \{4, 5, 9, 10\}$. Find

$$B \cap C$$



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30. If $A = \{1, 2, 4, 6, 7, 8\}$, $B = \{2, 5, 7, 9, 10\}$

and $C = \{4, 5, 9, 10\}$. Find

$$A \cup B \cup C$$



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31. If $A = \{1, 2, 4, 6, 7, 8\}$, $B = \{2, 5, 7, 9, 10\}$

and $C = \{4, 5, 9, 10\}$. Find

$$A \cap B \cap C$$



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32. If $A = \{1, 2, 4, 6, 7, 8\}$, $B = \{2, 5, 7, 9, 10\}$

and $C = \{4, 5, 9, 10\}$. Find

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



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33. If $A = \{2, 4, 6, 7, 8, 12\}$, $B = \{2, 7, 9, 10\}$

and $C = \{5, 9, 10, 12\}$. Find

$$A - B$$



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34. If $A = \{2, 4, 6, 7, 8, 12\}$, $B = \{2, 7, 9, 10\}$

and $C = \{5, 9, 10, 12\}$. Find

$B - C$



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35. If $A = \{2, 4, 6, 7, 8, 12\}$, $B = \{2, 7, 9, 10\}$

and $C = \{5, 9, 10, 12\}$. Find

$A - C$



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36. If $A = \{2, 4, 6, 7, 8, 12\}$, $B = \{2, 7, 9, 10\}$

and $C = \{5, 9, 10, 12\}$. Find

$$B - A$$



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37. If $A = \{2, 4, 6, 7, 8, 12\}$, $B = \{2, 7, 9, 10\}$

and $C = \{5, 9, 10, 12\}$. Find

$$C - A$$



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38. If $A = \{2, 4, 6, 7, 8, 12\}$, $B = \{2, 7, 9, 10\}$

and $C = \{5, 9, 10, 12\}$. Find

$$(A \cup B) - C$$



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39. If $A = \{2, 4, 6, 7, 8, 12\}$, $B = \{2, 7, 9, 10\}$

and $C = \{5, 9, 10, 12\}$. Find

$$A - (B \cap C)$$



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40. If $A = \{2, 4, 6, 7, 8, 12\}$, $B = \{2, 7, 9, 10\}$

and $C = \{5, 9, 10, 12\}$. Find

$$(A \cap B) - (C \cap A)$$



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41. If $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12\}$,

$A = \{2, 7, 9, 10\}$, $B = \{5, 9, 10, 12\}$ and $C = \{1, 4, 5, 7, 11\}$

$$. F \in dA'-C'$$



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42. If $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12\}$,

$A = \{2, 7, 9, 10\}$, $B = \{5, 9, 10, 12\}$ and $C = \{1, 4, 5, 7, 11\}$

. $F \in d(B-A)'$



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43. If $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12\}$,

$A = \{2, 7, 9, 10\}$, $B = \{5, 9, 10, 12\}$ and $C = \{1, 4, 5, 7, 11\}$

. $F \in d(B' \cap C)'$



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44. If $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12\}$,

$A = \{2, 7, 9, 10\}$, $B = \{5, 9, 10, 12\}$ and $C = \{1, 4, 5, 7, 11\}$

. Find $(A \cup B)^c$



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45. If $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12\}$,

$A = \{2, 7, 9, 10\}$, $B = \{5, 9, 10, 12\}$ and

$C = \{1, 4, 5, 7, 11\}$ Find $A' \cap B'$



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46. If X and Y are two sets such that $X \cup Y$ has 50 elements, X has 28 elements and Y has 32 elements, how many elements does $X \cap Y$ have?



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47. There are 200 individuals with a skin disorder, 120 had been exposed to the chemical A, 50 to chemical B and 30 to both chemical A and B, Find the number of individuals exposed

to

Chemical A but not chemical B.



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48. There are 200 individuals with a skin disorder, 120 had been exposed to the chemical A, 50 to chemical B and 30 to both chemical A and B, Find the number of individuals exposed to chemical B but not chemical A.



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49. There are 200 individuals with a skin disorder, 120 had been exposed to the chemical A, 50 to chemical B and 30 to both chemical A and B, Find the number of individuals exposed to Chemical A or chemical B.



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50. In a survey of 400 students in a school 100 were listed as taking apple juice, 150 as taking orange juice and 75 were listed as taking both

apple as well as orange juice. Find how many students were taking neither apple juice nor orange juice.



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51. In a committee, 50 people speak French, 20 speak Spanish and 10 speak both Spanish and French. How many speak at least one of these two languages?



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52. In a group of 65 people, 40 like cricket, 10 like both cricket and tennis, how many like tennis only and not cricket † How many like tennis?



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53. Let A and B be two sets such that

$$n(A) = 20$$

$$n(A \cup B) = 42, n(A \cap B) = 4. \text{ Find}$$

$$n(B)$$



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54. Let A and B be two sets such that

$$n(A) = 20$$

$$n(A \cup B) = 42, n(A \cap B) = 4. \text{ Find}$$

$$n(B - A)$$



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55. Let A and B be two sets such that

$$n(A) = 20$$

$$n(A \cup B) = 42, n(A \cap B) = 4. \text{ Find}$$

$$n(A - B)$$



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56. $A = \{x: x \text{ is a natural number less than } 8\}$

Write in roster form.



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57. $A = \{x: x \text{ is a natural number less than } 8\}$

Write a subset of A containing all even numbers in A .



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58. $A = \{x: x \text{ is a natural number less than } 8\}$

Which of the following could not be the number of elements of power set of a set?

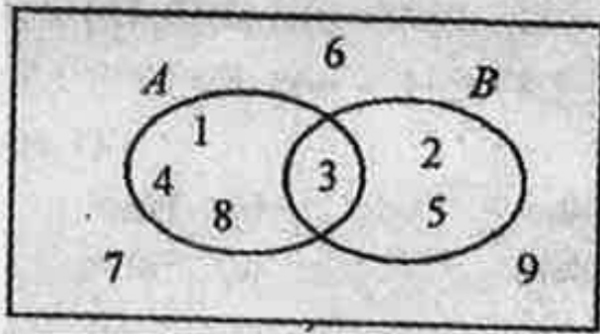
[2, 8, 10, 16]



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59. Observe the Venn diagram.

Find $(A \cap B)'$



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60. Consider the sets A and B given by

$$A = \{x : x \text{ is a natural number, } 2 \leq x \leq 6\}$$

$$B = \{x : x \text{ is a prime number } x \leq 7\}$$

$$C = \{x : x^2 - 5x + 6 = 0\}$$

Write A, B and C in the roster form.



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61. Consider the sets A and B given by

$$A = \{x : x \text{ is a natural number, } 2 \leq x \leq 6\}$$

$$B = \{x : x \text{ is a prime number } x \leq 7\}$$

$$C = \{x : x^2 - 5x + 6 = 0\}$$

Verify that $(A \cup B) \cup C = A \cup (B \cup C)$



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62. Consider the sets A and B given by

$$A = \{x : x \text{ is a prime number } < 10\}$$

$B = \{x : x \text{ is a natural number which divides } 12\}$

Write A and B in the roster form.



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63. Consider the sets A and B given by

$A = \{x : x \text{ is a prime number } < 10\}$

$B = \{x : x \text{ is a natural number which divides } 12\}$

Find $A \cup B$ and $B - A$.



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64. Consider the sets A and B given by

$$A = \{x : x \text{ is a prime number } < 10\}$$

$$B = \{x : x \text{ is a natural number which divides } 12\}$$

Verify that $(A \cup B) - A = B - A$



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65. If $A = \{1\}$, $B = \{\{1\}, 2\}$, $C = \{\{1\}, 3\}$ and

$U = \{\{1\}, \{2\}, \{3\}, 1, 2, 3\}$, then find

$$A \cap B$$



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66. If $A = \{1\}$, $B = \{\{1\}, 2\}$, $C = \{\{1\}, 3\}$ and

$U = \{\{1\}, \{2\}, \{3\}, 1, 2, 3\}$, then find

$$B \cap C$$



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67. If $A = \{1\}$, $B = \{\{1\}, 2\}$, $C = \{\{1\}, 3\}$ and

$U = \{\{1\}, \{2\}, \{3\}, 1, 2, 3\}$, then find

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



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68. Given $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$,

$A = \{1, 2, 3, 4, 5\}$ and $B = \{3, 4, 5, 6\}$

Write $A \cup B$



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69. Given $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$,

$A = \{1, 2, 3, 4, 5\}$ and $B = \{3, 4, 5, 6\}$

Verify whether $(A \cup B)' = A' \cap B'$



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70. Given $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$,

$A = \{1, 2, 3, 4, 5\}$ and $B = \{3, 4, 5, 6\}$

Verify

whether

$$n(A \cup B) = n(A - B) + n(A \cap B) + n(B - A)$$



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71. Let $A = \{x : x \text{ is an integer } \frac{1}{2} < x < \frac{7}{2}\}$

and $B = \{2, 3, 4\}$

Write A in the roster form.



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72. Let $A = \{x : x \text{ is an integer } \frac{1}{2} < x < \frac{7}{2}\}$
and $B = \{2, 3, 4\}$

Find the power set of $(A \cup B)$



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73. Let $A = \{x : x \text{ is an integer } \frac{1}{2} < x < \frac{7}{2}\}$
and $B = \{2, 3, 4\}$

Verify that $(A - B) \cup (A \cap B) = A$



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74. How many elements has $P(A)$

if $A = \{1, 2, 3\}$?



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75. $U = \{1, 2, 3, 4, 5, 6, 7\}$, $A = \{1, 4, 6, 7\}$,

$B = \{1, 2, 3\}$. Find A' , B' , $A' \cap B'$, $A \cup B$

and

hence show that $A' \cap B' = (A \cup B)'$



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76. If A and B are two sets such that $A \subset B$, then what is $A \cap B$?



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77. Let $A = \{1, 2, 3, 4, 5, 6\}$ and $B = \{1, 3, 4, 6, 7\}$

Find $A \cup B$ and $A \cap B$



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78. Let $A = \{1, 2, 3, 4, 5, 6\}$ and

$$B = \{1, 3, 4, 6, 7\}$$

Find $A - (A \cap B)$



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79. If X and Y are two sets such that

$$n(X) = 17, n(Y) = 23 \text{ and } n(X \cup Y) = 38,$$

Find $n(X \cap Y)$.



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80. Let $U = (12, 3, 4, 5, 6, 7, 8, 9)$,

$A = (1, 2, 4, 7)$ and $B = (1, 3, 5, 7)$

Find $A \cup B$.



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81. Let $U = (12, 3, 4, 5, 6, 7, 8, 9)$,

$A = (1, 2, 4, 7)$ and $B = (1, 3, 5, 7)$

Find A', B' and hence show that

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



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82. Let $U = (1, 2, 3, 4, 5, 6, 7, 8, 9)$,

$A = (1, 2, 4, 7)$ and $B = (1, 3, 5, 7)$

The power set $P(A)$ has elements.



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83. If two sets A and B are disjoint, which none among the following is true?

A. $A \cup B = A$

B. $A \cup B = B$

C. $A \cap B = B$

D. $A \cap B = \emptyset$

Answer: D



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84. Find the set of the equation

$x^2 + x - 2 = 0$ in roster form.



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85. In a group of students, 100 students know Hindi, 50 know English and 33 know both. Each of the students knows either Hindi or English. How many students are there in the group?



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86. Let $A = \{x : x \in W, x < 5\}$ and $B = \{x : x \text{ is a prime number less than } 5\}$ and $U = \{x : x \text{ is an integer } 0 \leq x \leq 6\}$

Write A,B in roster form.



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87. Let $A = \{x : x \in W, x < 5\}$ and

$B = \{x : x \text{ is a prime number less than } 5\}$ and

$U = \{x : x \text{ is an integer } 0 \leq x \leq 6\}$

Find $(A - B) \cup (B - A)$



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88. Let $A = \{x : x \in W, x < 5\}$ and

$B = \{x : x \text{ is a prime number less than } 5\}$ and

$$U = \{x : x \text{ is an integer } 0 \leq x \leq 6\}$$

$$\text{Verify } (A \cup B)' = A' \cap B'$$



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89. If $U = \{1, 2, 3, 4, 5, 6, 7, 8\},$

$A = \{2, 4, 6, 8\}$ and $B = \{2, 4, 8\}$ then:

Write A', B' .



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90. If $U = \{1, 2, 3, 4, 5, 6, 7, 8\}$,

$A = \{2, 4, 6, 8\}$ and $B = \{2, 4, 8\}$ then:

For the above sets A and B prove that

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



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91. If $U = \{1, 2, 3, 4, 5, 6, 7, 8\}$,

$A = \{2, 4, 6, 8\}$ and $B = \{2, 4, 8\}$ then:

Check whether $(A \cap B)' = A' \cup B'$



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92. What is $A \cup A'$?



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93. If A and B are two sets such that

$$n(A \cup B) = 17 \text{ and } n(A \cap B) = 5,$$

find $n(A) + n(B)$



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94. In a group of 100 peoples, 40 people like cinema, 10 like both drama and cinema. How many like drama? How many like drama only not cinema?



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95. If A and B are two sets such that $A \subset B$,

$A \cup B$ is.....



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96. If A and B are two sets such that $A \subset B$,

Draw the venn diagram of $B - A$



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97. In a committee, 60 people speak English, 30 speak Hindi and 15 speak both English and Hindi. How many speak atleast one of these two languages?



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98. Consider the set $A = \{2, 3, 5, 7\}$ and

$$B = \{1, 2, 3, 4, 6, 12\}$$

Find $A \cap B$.



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99. Consider the set $A = \{2, 3, 5, 7\}$ and

$$B = \{1, 2, 3, 4, 6, 12\}$$

Find $A - B$, $B - A$ and hence show that

$$(A \cap B) \cup (A - B) \cup (B - A) = A \cup B.$$



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100. Consider the set $A = \{2, 3, 5, 7\}$ and
 $B = \{1, 2, 3, 4, 6, 12\}$

Write the power set of $A \cap B$.



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101. If $A = \{1, 2, 3, 4\}$ and $B = \{3, 4, 5, 6\}$
then

$A - B = ?$



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102. In a group of 70 people, 37 like coffee, 52 like tea and each person likes atleast one of the two drinks. How many people like both coffee and tea?



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103. Let $U = \{1, 2, 3, 4, 5, 6\}$, $A = \{2, 3\}$ and $B = \{3, 4, 5\}$. Find A', B' and hence show that $(A \cup B)' = A' \cap B'$.



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104. Let $A = \{1, 2, 3, 4, 5\}$, $B = \{1, 2, 6\}$ and

$$C = \{1, 6, 7, 8\}$$

Find $A \cup B$ and $B \cap C$.



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105. Let $A = \{1, 2, 3, 4, 5\}$, $B = \{1, 2, 6\}$ and

$$C = \{1, 6, 7, 8\}$$

Show

that

$$A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$$



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106. Let $A = \{1, 2, 3, 4, 5\}$, $B = \{1, 2, 6\}$ and $C = \{1, 6, 7, 8\}$

Find $A - (B \cap C)$ and

$$(A \cup B) - (B \cap C)$$



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107. $A : \{x : x \text{ is a prime number } x \leq 6\}$

Represent A in Roster form.



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108. $A : \{x : x \text{ is a prime number } x \leq 6\}$

Write the power set of A.



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109. Out of 25 members in an office 17 like to take tea, 16 like to take coffee. Assume that each takes at least one of the two drinks. How many like (a) Both coffee and tea (b) Only tea and not coffee?



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110. If a subset of the set B, then

$$A \cap B = ?$$



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111. Represent the set $A \cap B$ by venn diagram.



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112. In a school, there are 20 teachers who teach Mathematics or Physics. Of These, 12

teach Mathematics, 12 teach Physics. How many teach both the subject?



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113. If U is the universal set and A is any set

$$U \cap A$$

A. U

B. A

C. emptyset

D. A'

Answer: B



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114. Consider the sets

$$U = \{a, b, c, d, e, f, g\}, A = \{b, c, d, e\},$$

$B = \{a, c, g\}$. Find A' and B' the verify

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



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115. In a group of 400 people, 250 speaks Hindi, 200 can speak Malayalam. How many people can speak both Malayalam and Hindi?



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