

4.6: Exercises

1. List out the elements of the set “The letters of the word Mississippi.”
2. List out the elements of the set “Months of the year.”
3. Write a word description of the set $\{3, 6, 9\}$.
4. Write a word description of the set $\{a, e, i, o, u\}$.
5. Is $\{1, 3, 5\}$ a subset of the set of odd integers?
6. Is $\{A, B, C\}$ a subset of the set of letters of the alphabet?

For problems 7-12, consider the sets below, and indicate if each statement is true or false.

$$A = \{1, 2, 3, 4, 5\} \quad B = \{1, 3, 5\} \quad C = \{4, 6\} \quad U = \text{whole numbers from 0 to 10}$$

7. $3 \in B$
8. $5 \in C$
9. $B \subset A$
10. $C \subset A$
11. $C \subset B$
12. $C \subset U$

Using the sets from above, and treating U as the Universal set, find each of the following:

13. $A \cup B$
14. $A \cup C$
15. $A \cap C$
16. $B \cap C$
17. A'
18. B'

Let $D = \{b, a, c, k\}$, $E = \{t, a, s, k\}$, $F = \{b, a, t, h\}$. Using these sets, find the following:

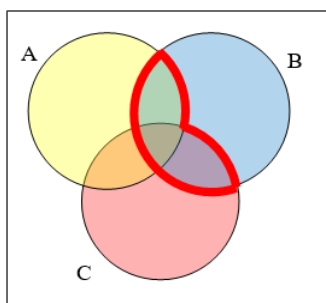
19. $D' \cap E$
20. $F' \cap D$
21. $(D \cap E) \cup F$
22. $D \cap (E \cup P)$
23. $(F \cap E)' \cap D$
24. $(D \cup E)' \cap F$

Create a Venn diagram to illustrate each of the following:

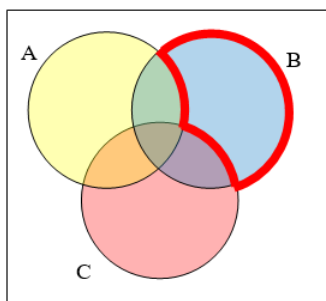
25. $(F \cap E) \cup D$
26. $(D \cup E)' \cap F$
27. $(F' \cap E') \cap D$
28. $(D \cup E) \cup F$

Write an expression for the shaded region.

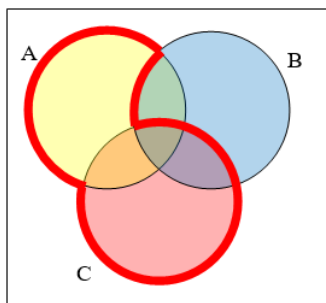
- 29.



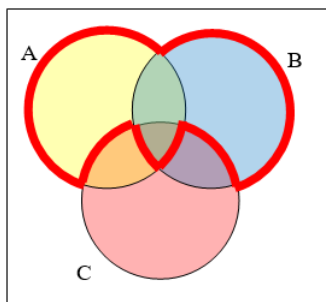
30.



31.



32.



Let $A = \{1, 2, 3, 4, 5\}$ $B = \{1, 3, 5\}$ $C = \{4, 6\}$ Find the cardinality of the given set.

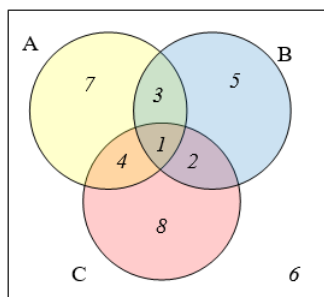
33. $n(A)$

34. $n(B)$

35. $n(A \cup C)$

36. $n(A \cap C)$

The Venn diagram here shows the cardinality of each set. Use this in 37-40 to find the cardinality of given set.



37. $n(A \cap C)$

38. $n(B \cup C)$

39. $n(A \cap B \cap C')$

40. $n(A \cap B' \cap C)$

41. If $n(G) = 20$, $n(H) = 30$, $n(G \cap H) = 5$, find $n(G \cup H)$.

42. If $n(G) = 5$, $n(H) = 8$, $n(G \cap H) = 4$, find $n(G \cup H)$.

43. A survey was given asking whether respondents if they watch movies at home from Netflix, Redbox, or Hulu. Use the results to determine how many people use Redbox.

52 only use Netflix	62 only use Redbox
24 only use Hulu	16 use only Hulu and Redbox
48 use only Netflix and Redbox	30 use only Hulu and Netflix
10 use all three	25 use none of these

44. A survey asked buyers whether color, size, or brand influenced their choice of cell phone. The results are below. How many people were influenced by brand?

5 only said color	8 only said size
16 only said brand	20 said only color and size
42 said only color and brand	53 said only size and brand
102 said all three	20 said none of these

45. Use the given information to complete a Venn diagram, then determine: a) how many students have seen exactly one of these movies, and b) how many had seen only *Star Wars*.

18 had seen The Matrix (M)	24 had seen Star Wars (SW)
20 had seen Lord of the Rings (LotR)	10 had seen M and SW
14 had seen LotR and SW	12 had seen M and LotR
6 had seen all three	

46. A survey asked people what alternative transportation modes they use. Use the data to complete a Venn diagram, then determine: a) what percent of people only ride the bus, and b) how many people don't use any alternate transportation.

30% use the bus	20% ride a bicycle
25% walk	5% use the bus and ride a bicycle
10% ride a bicycle and walk	12% use the bus and walk
2% use all three	

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