

East Los Angeles College

Department of Mathematics

Math 230

Test 1

Solutions

Determine the listed items for the indicated sets.

1. $A = \{x | x \text{ is a vowel}\}$

$$A = \{a, e, i, o, u\} \quad \checkmark$$

2. $B = \{x | x \text{ is a city in California}\}$

$$B = \{\text{Los Angeles, San Diego, ... , San Francisco}\} \quad \checkmark$$

3. $C = \{x | x \text{ is a fruit}\}$

$$C = \{\text{apple, kiwi, ... , orange}\} \quad \checkmark$$

4. $D = \{x | x \text{ is a color}\}$

$$D = \{\text{blue, green, ... , red}\} \quad \checkmark$$

5. N

$$N = \{1, 2, 3, \dots\} \quad \checkmark$$

6. W

$$W = \{0, 1, 2, 3, \dots\} \quad \checkmark$$

7. Z

$$Z = \{\dots, -2, -1, 0, 1, 2, 3, \dots\} \quad \checkmark$$

8. ϕ

$$\{\} \quad \checkmark$$

9. $E = \{x | x \text{ is a natural number and } x > 3\}$

$$E = \{4, 5, 6, \dots\} \quad \checkmark$$

10. $F = \{x | x \text{ is a whole number and } x \leq 5\}$

$$F = \{0, 1, 2, \dots, 5\} \quad \checkmark$$

10 ✓

Let the universe $U = \{a, b, c, d, e, 1, 2, 3, 4, 5, 6\}$

$A = \{a, b, c, 1, 2, 3\}$ $B = \{1, 2, 3, 4\}$ $C = \{2, 4, 6\}$

Determine the following operations.

11. $A \cup B$

$$\{a, b, c, 1, 2, 3, 4\}$$

12. $A \cap B$

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

13. $B \cup C$

$$\{1, 2, 3, 4, 6\}$$

$$\{1, 2, 3, 4, 6\}$$

14. $B \cap C$

$$\{2, 4\}$$

15. A' not A

$$\{d, e, 4, 5, 6\}$$

16. B' not B

$$\{a, b, c, d, e, 5, 6\}$$

17. C' not C

$$\{a, b, c, d, e, 1, 3, 5\}$$

18. $n(A \cup B)$

$$7$$

19. $n(A \cap B)$

$$3$$

20. $n(A)$

$$6$$

21. $n(B)$

$$4$$

22. $n(C)$

$$3$$

23. $n(A')$

$$5$$

24. $n(B')$

$$7$$

25. $n(C')$

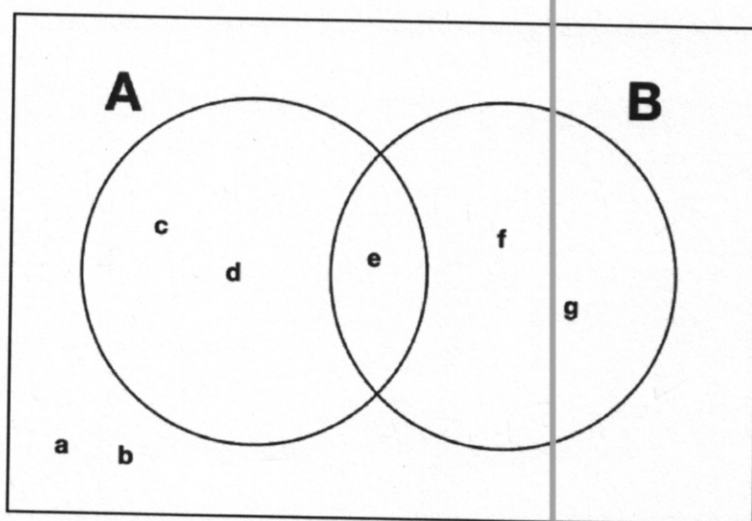
$$8$$

26. $n(U)$

$$11$$

16 ✓

Consider the following Venn Diagram of two sets.



Determine the following.

27. A

$\{c, d, e\}$ ✓

28. B

$\{e, f, g\}$ ✓

29. A'

$\{a, b, f, g\}$ ✓

30. B'

$\{a, b, c, d\}$ ✓

31. $A \cup B$

$\{c, d, e, f, g\}$ ✓

32. $A \cap B$

$\{e\}$ ✓

33. $A - B$

A and not B
(A only)

$\{c, d\}$ ✓

34. $B - A$

B and not A
(B only)

$\{f, g\}$ ✓

35. U

$\{a, b, c, d, \dots, g\}$ ✓

36. $n(U)$

(7) ✓

37. $n(A)$

(3) ✓

38. $n(B)$

(3) ✓

39. $n(A')$

(4) ✓

40. $n(B')$

(4) ✓

41. $n(A \cup B)$

(5) —

42. $n(A \cap B)$

(1) —

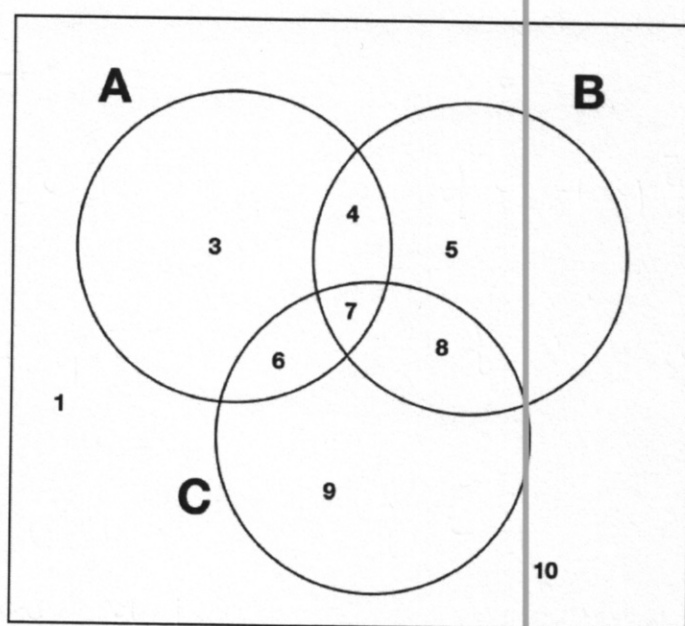
43. $n(A - B)$

(2) ✓

44. $n(B - A)$

(2) —

Consider the following Venn Diagram of three sets.



Determine the following.

45. U

{1, 3, 4, ..., 10} —

46. A

{3, 4, 6, 7} —

47. B

{4, 5, 7, 8} —

48. C

{6, 7, 8, 9} —

49. $A \cup B \cup C$

{3, 4, ..., 9} —

50. $A \cap B \cap C$

{7} —

10 —

51. $(A \cup B \cup C)'$

not $\{3, 4, \dots, 9\}$

$\{1, 10\}$ ✓

53. $A \cup C$

$\{3, 4, 6, 7, 8, 9\}$ ✓

55. $(A \cup C)'$

not $\{3, 4, \dots, 9\}$

$\{1, 10\}$ ✓

52. $(A \cap B \cap C)'$

not $\{7\}$

$\{1, 3, 4, 5, 6, 8, 9, 10\}$

54. $B \cap C$

$\{7, 8\}$ ✓

56. $(B \cap C)'$

not $\{7, 8\}$ ✓

$\{1, 3, 4, 5, 6, 9, 10\}$

57. What is your name?

Solutions

G ✓