



MTM3100 - Pré-cálculo

Gabarito parcial da 1ª lista complementar de exercícios

1. Há mais de uma forma de representar um conjunto por propriedade.

- (a) (b) $B = \{x \in \mathbb{N} \mid 4 \leq x \leq 9\}$;
(c) (d) $D = \{x \in \mathbb{N} \mid x \geq 6\}$;
(e)

2. (a) V; (b) (c) V; (d)
(e) F; (f) (g) V.

3. (a) $A = \{2, 3, 5, 7, 11\}$; (b) (c) $\{2, 5\}$;
(d) (e) $\{3, 7, 11\}$; (f)

4. (a) $A = \{1, -1, 2, -2, 7, -7, 14, -14\}$; (b) $B = \{\dots, -9, -6, -3, 0, 3, 6, \dots\}$;
(c) $C = \{2, 3, 5, 7, 11, 13, 17, 19, 23, 29\}$; (d) $D = \{2, -2, 3, -3, 5, -5, 7, -7\}$;
(e) $E = \{2\}$; (f) $F = \emptyset$;
(g) $G = \{a, r\}$.

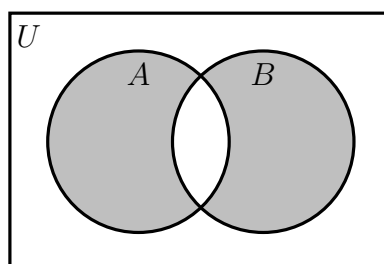
5. (a) $A = \emptyset$; (b) $B = \{0, 2, 4, 6, \dots\}$;
(c) $C = \{1, 3, 5, 7, \dots\}$; (d) $D = \{0, 3, 6, 9, \dots\}$;
(e) $E = \{-1, 4, 9, 14, 19, \dots\}$; (f) $F = \{4, 5\}$;
(g) $G = \{5, 6, 7\}$; (h) $H = \{5\}$;
(i) $I = \emptyset$;

6. (a) V; (b) (c) V; (d)
(e) F; (f) (g) F; (h)

7. (a) V; (b) (c) V; (d)
(e) V; (f) (g) F; (h)
(i) F; (j) (k) V; (l)
(m) F.

8. (a) V; (b) F; (c) F; (d) F;
 (e) V; (f) V; (g) V; (h) V.
9. (a) V; (b) V; (c) F; (d) V;
 (e) F; (f) V; (g) V; (h) F;
 (i) F.
10. Há 10 subconjuntos com três elementos: $\{1, 2, 3\}$, $\{1, 2, 4\}$, $\{1, 2, 5\}$, $\{1, 3, 4\}$, $\{1, 3, 5\}$, $\{1, 4, 5\}$, $\{2, 3, 5\}$, $\{2, 4, 5\}$, $\{3, 4, 5\}$ e $\{2, 3, 4\}$.
11. (a) (b) (c)
 (d) (e) (f)
12. (a) (b) (c) (d)
13. (a) (1), (2), (3) e (5); (b) (1), (2), (4) e (7);
 (c) (1) e (2); (d) (1) e (3);
 (e) (1) e (4); (f) (1);
 (g) (1), (2), (3), (4), (5) e (7); (h) (1), (2), (3), (4), (5) e (6);
 (i) (1), (2), (3), (4), (6) e (7); (j) (1), (2), (3), (4), (5), (6) e (7);
 (k) (1), (2), (3), (4), (5), (6), (7) e (8); (l) (4), (6), (7) e (8);
 (m) (3), (5), (6) e (8); (n) (3), (4), (5), (6), (7) e (8);
 (o) (2), (3), (5), (6), (7) e (8); (p) (7) e (8);
 (q) (6) e (8); (r) (2), (3), (4), (5), (6), (7) e (8);
 (s) (8).
14. (a) (2) e (8); (b) (3) e (4);
 (c) (1) e (6); (d) (1), (3), (4) e (6);
 (e) (5) e (7).
15. Região (1): $A \cap B \cap C$;
 Região (2): $A \cap B \cap \bar{C}$;
 Região (3): $A \cap \bar{B} \cap C$;
 Região (4): $\bar{A} \cap B \cap C$;
 Região (5): $A \cap \bar{B} \cap \bar{C}$;
 Região (6): $\bar{A} \cap \bar{B} \cap C$;
 Região (7): $\bar{A} \cap B \cap \bar{C}$;
 Região (8): $\bar{A} \cap \bar{B} \cap \bar{C}$.
16. Com 4 conjuntos haverá $2^4 = 16$ regiões. Para n conjuntos, haverá 2^n regiões.
17. 0.

18. (a) $A \cap D = \{0, 2, 3, 5\}$; (b) $A \cap B = \{0, 2, 4, 6, 8\} = B$; (c) $A \cap C = \{1, 3, 7\} = C$;
 (d) $B \cap C = \emptyset$; (e) $C \cap \emptyset = \emptyset$; (f) $B \cap D = \{0, 2\}$;
 (g) $A \cap C \cap D = \{3\}$; (h) $A \cap B \cap C \cap D = \emptyset$.
19. (a) $A \cup D = \{-2, -1, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9\}$; (b)
 (c) $A \cup C = A$; (d)
 (e) $B \cup \emptyset = B$; (f)
20. (a) $A - B = \{1, 3, 5, 7, 9\}$; (b)
 (c) $A - C = \{0, 2, 4, 6, 8, 9\}$; (d)
 (e) $A - D = \{1, 4, 6, 7, 8, 9\}$; (f)
 (g) $A - \emptyset = A$; (h)
 (i) $B - C = B$; (j)
21. (a) $\complement_A^B = A - B = \{1, 3, 5, 7, 9\}$; (b)
 (c) $\complement_A^D = A - D = \{1, 4, 6, 7, 8, 9\}$; (d)
 (e) $\complement_C^C = C - C = \emptyset$; (f)
 (g) $\complement_D^B = D - B = \{-2, -1, 3, 5\}$; (h)
 (i) $\complement_C^A = C - A = \emptyset$;
22. (a) $A - (B \cup C) = \{5, 9\}$;
 (b) $\complement_A^{(C \cap A)} = \{0, 2, 4, 5, 6, 8, 9\}$;
 (c) $A - (B \cap C) = A - \emptyset = A = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9\}$.
23. (a) $B \Delta D = \{-2, -1, 3, 4, 5, 6, 8\}$; (b) $(B \cup D) - (B \cap D) = \{-2, -1, 3, 4, 5, 6, 8\}$.
 $B \Delta D = (B \cup D) - (B \cap D)$ para quaisquer conjuntos.
24. (a) $B \cap (C \cup D) = \{0, 2\}$; (b) $(B \cap C) \cup (B \cap D) = \{0, 2\}$.
 $B \cap (C \cup D) = (B \cap C) \cup (B \cap D)$ para quaisquer conjuntos.
25. (a) $A \cup (B \cap D) = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9\}$; (b) $(A \cup B) \cap (A \cup D) = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9\}$.
 $A \cup (B \cap D) = (A \cup B) \cap (A \cup D)$ para quaisquer conjuntos.
26. $A \Delta B$ corresponde à região



27. A fórmula correta é

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

28. (a) 42; (b)

29. (a) 15; (b) (c) (d)

30. $\{4, 5\}$; $\{0, 4, 5\}$; $\{4, 5, 6\}$; $\{0, 4, 5, 6\}$.

31. 2^{39} subconjuntos.

32.

33. (a) $X = \{1, 6, 9, 11\}$;

(b) $Y = \{0, 2, 4, 7, 8\}$;

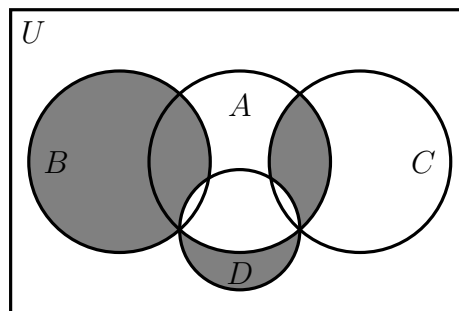
(c) $\overline{X} \cap \overline{Y} = \{3, 5, 10, 12, 13\}$.

34. (a) $\overline{A \cap B} = \{2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13\}$; (b) $\overline{A} \cup \overline{B} = \{2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13\}$;

(c) $\overline{A \cup B} = \{2, 3, 4, 10, 11, 12, 13\}$; (d) $\overline{A} \cap \overline{B} = \{2, 3, 4, 10, 11, 12, 13\}$.

$\overline{A \cap B} = \overline{A} \cup \overline{B}$ e $\overline{A \cup B} = \overline{A} \cap \overline{B}$ para quaisquer conjuntos A e B .

35.



36. (a) (b) (c)

37. (a) $n(A \cap B \cap C) = 2$; (b)

(c) (d) $n(A - (B \cap C)) = 15$.