



MTM3100 - Pré-cálculo

Gabarito parcial da 1ª lista de exercícios

1. (a) $A = \{0, 1, 2, 3, 4, 5\}$; (b) $B = \{-2, -1, 0, 1, 2, 3, 4\}$;
(c) $C = \{0, 2, 4, 6, 8, 10\}$; (d) $D = \{1, 2, 3, 4, 6, 12\}$;
(e) $E = \{0, 7, 14, 21\}$; (f) $F = \emptyset$;
(g) $G = \mathbb{N}$; (h) $H = \{\dots, -5, -3, -1, 1, 3, 5, \dots\}$;
(i) $I = \{3\}$; (j) $J = \{-1, 1\}$;
(k) $K = \emptyset$; (l) $L = \{\dots, -6, -5, -4, 5, 6, 7, \dots\}$.
2. Há mais de uma forma de representar um conjunto por propriedade.
(a) $A = \{x \in \mathbb{N} \mid x \text{ é múltiplo de } 5\}$; (b) $B = \{x \in \mathbb{N} \mid x \text{ é divisor de } 6\}$;
(c) $C = \{x \in \mathbb{Z} \mid x \text{ é ímpar}\}$; (d) $D = \{x \in \mathbb{N} \mid x \leq 7\}$;
(e) $E = \{x \in \mathbb{Z} \mid x \leq 3\}$.
3. (a) V; (b) (c) V; (d) (e) F;
(f) (g) F; (h) (i) F; (j)
(k) F; (l) (m) F; (n) (o) V;
(p) (q) F; (r) (s) F; (t)
4. (a) $C = \{b, e\}$; (b) $D = \{a, b, c, d, e, f, h\}$; (c) $E = \{a, f\}$;
(d) (e) $G = \{a, f, g, i\}$; (f)
(g) $I = \{a, b, c, d, e, f, g, h, i\}$; (h)
5. $n(A) = 5$, $n(B) = 6$, $n(C) = 2$, $n(D) = 7$, $n(E) = 2$, $n(F) = 5$, $n(G) = 4$, $n(H) = 3$, $n(I) = 9$ e $n(J) = 2$.
- 6.
7. (a) $C = \{2, 5\}$;
(b) $D = \{1, 2, 4, 5, 6, 8\}$;
(c) $E = \{4, 6, 8\}$;
(d)

8. (a) 12.
 (b) 4.
 (c) 17.
9. (a) F; (b) V; (c) V; (d) F;
 (e) V; (f) (g) F; (h) F;
 (i)
10. 72.
11. (a) $A = \{a, b, g, h, i, m, n, o, p\}$;
 (b)
 (c) $E = \{a, b, d, e, f, g, h, i, l, m, n, o, p\}$;
 (d)
 (e) $G = \{c, g, j, n, o\}$
 (f)
12. (a) $n(B) = 8$; (b) (c) $n(L) = 3$; (d)
 (e) $n(P) = 2$; (f) (g) $n(R) = 5$.
13. (a) V; (b) V; (c) F; (d) F;
 (e) V; (f) F; (g) V.
14. (a) V; (b) (c) F; (d)
 (e) F; (f) (g) V; (h)
 (i) F; (j) (k) V; (l)
 (m) V; (n) (o) V; (p)
 (q) F; (r) (s) V; (t)
15. (a) V; (b) F; (c) V; (d) V;
 (e) F; (f) V; (g) V; (h) V;
 (i) V; (j) V; (k) V; (l) F.
16. (a) $\mathcal{P}(A) = \{\emptyset, \{2\}, \{3\}, \{2, 3\}\}$, $n(\mathcal{P}(A)) = 4$;
 (b)
 (c) $\mathcal{P}(C) = \{\emptyset, \{2\}, \{4\}, \{6\}, \{2, 4\}, \{2, 6\}, \{4, 6\}, \{2, 4, 6\}\}$, $n(\mathcal{P}(C)) = 8$;
 (d) $\mathcal{P}(D) = \{\emptyset\}$, $n(\mathcal{P}(D)) = 1$;
 (e)
17. (a) $A \cap B = \{1, 2, 3, 4, 6\}$; (b) $A \cup B = \{0, 1, 2, 3, 4, 5, 6, 8, 9\}$;
 (c) $A - B = \{0, 5\}$; (d) $B - A = \{8, 9\}$.

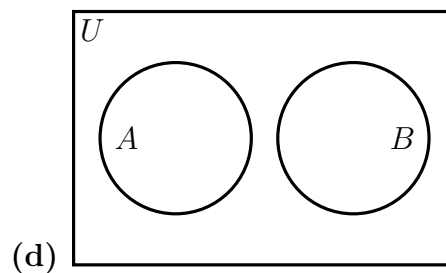
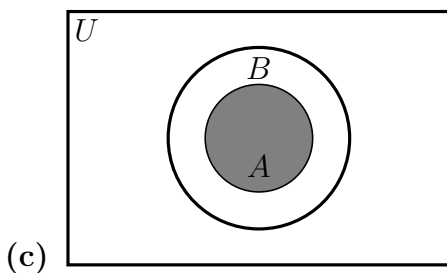
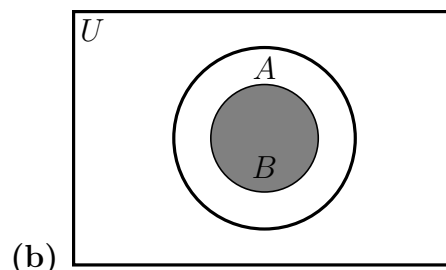
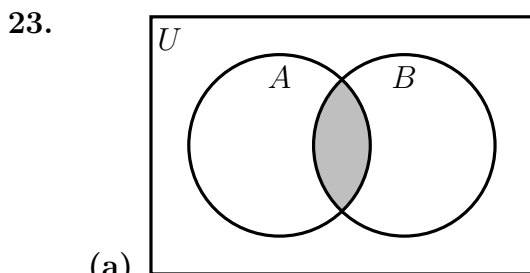
18. (a) $\bar{A} = \{b, c, d, i, j\}$; (b) $\bar{B} = \{b, c, e, g, h, i, j\}$;
 (c) $\overline{A \cap B} = \{b, c, d, e, g, h, i, j\}$; (d) $\overline{A \cup B} = \{b, c, i, j\}$;
 (e) $\overline{A - B} = \{a, b, c, d, f, i, j\}$; (f) $\overline{B - A} = \{a, b, c, e, f, g, h, i, j\}$;
 (g) $\bar{A} \cap \bar{B} = \{b, c, i, j\}$.

19. (a) (1); (b) (1), (2) e (3); (c)
 (d) (3) e (4); (e) (2) e (4); (f)
 (g) (4); (h) (1), (3) e (4); (i)

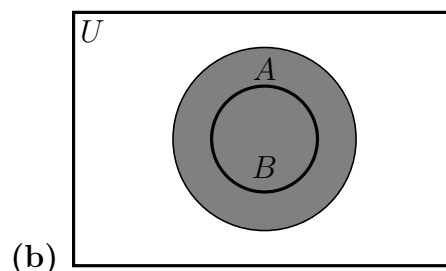
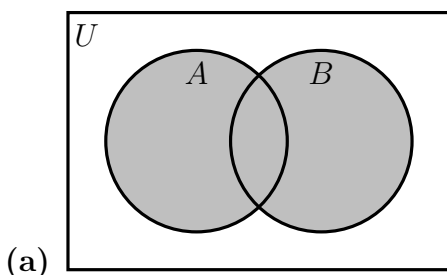
20. Região (1): $A \cap B$;
 Região (2): $A \cap \bar{B}$;
 Região (3): $\bar{A} \cap B$;
 Região (4): $\bar{A} \cap \bar{B}$.

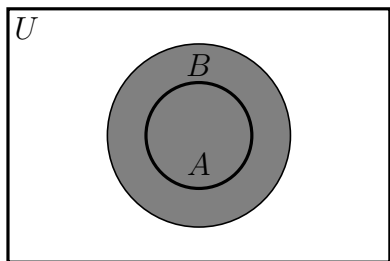
21. 260.

22. (a) 120;
 (b) 725;
 (c) 850;
 (d) 150.

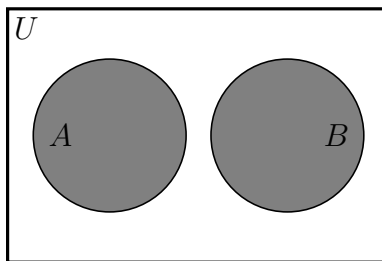


24. Para $A \cup B$,



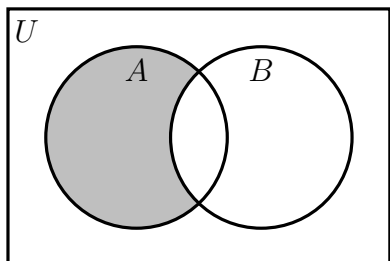


(c)

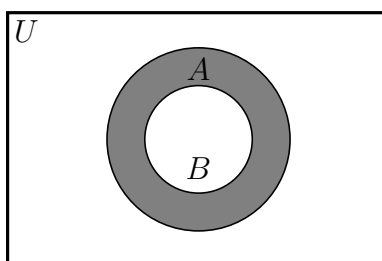


(d)

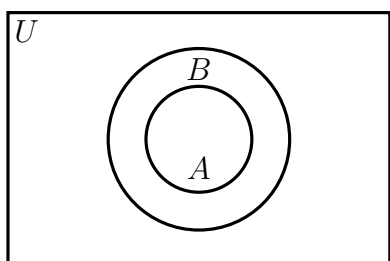
Para $A - B$,



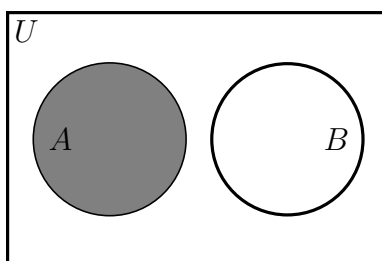
(a)



(b)

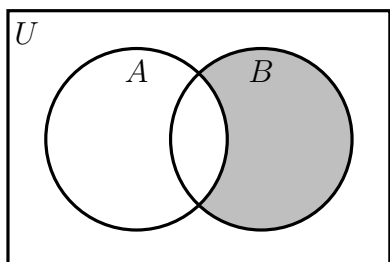


(c)

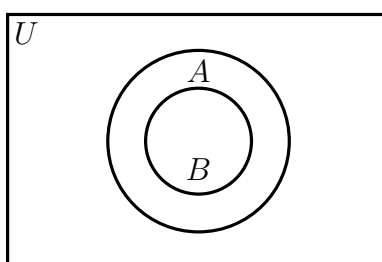


(d)

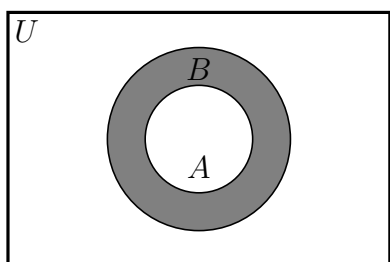
Para $B - A$,



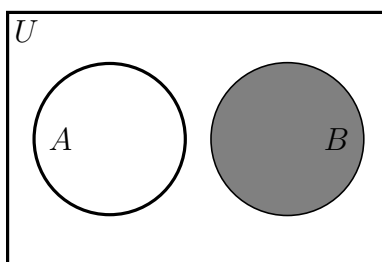
(a)



(b)



(c)



(d)

25. (a) $n(A \cap B) = 3$; (b) (c) $n(\bar{A}) = 4$;
 (d) (e) $n(\overline{A \cap B}) = 8$; (f)
26. (a) 25; (b) 30; (c)
 (d) 9; (e) 23; (f)

27. Como o conjunto possui 8 elementos, então há $2^8 = 256$ subconjuntos.

28. (a) V; (b) V;
(c) V; (d) V;
(e) Se $A \subset B$, então $A - B = \emptyset$; (f) Se $A - B = A$, então $A \cap B = \emptyset$;
(g) Se $A \subset B$, então $A - B \emptyset$; (h) V;
(i) $A \cap \emptyset = \emptyset, \forall A$; (j) V;
(k) V; (l) V.
29. (a) 83; (b) (c) (d)
30. (a) $A \times B = \{(1, 3), (1, 4), (1, 5), (2, 3), (2, 4), (2, 5)\}$;
(b)
(c) $A \times A = \{(1, 1), (1, 2), (2, 1), (2, 2)\}$;
(d)
(e) $A \times \emptyset = \emptyset$.
31. (a) $A \times B \times C = \{(1, -2, -1), (1, -2, 0), (1, -2, 1), (1, -2, 4), (1, 1, -1), (1, 1, 0), (1, 1, 1), (1, 1, 4), (1, 2, -1), (1, 2, 0), (1, 2, 1), (1, 2, 4), (3, -2, -1), (3, -2, 0), (3, -2, 1), (3, -2, 4), (3, 1, -1), (3, 1, 0), (3, 1, 1), (3, 1, 4), (3, 2, -1), (3, 2, 0), (3, 2, 1), (3, 2, 4)\}$;
(b) $A^3 = \{(1, 1, 1), (1, 1, 3), (1, 3, 1), (1, 3, 3), (3, 1, 1), (3, 1, 3), (3, 3, 1), (3, 3, 3)\}$.