



Universidade Federal de Santa Catarina
Centro de Ciências Físicas e Matemáticas
Departamento de Matemática



MTM3100 - Pré-cálculo

Gabarito parcial da 2ª lista complementar de exercícios

1. (a) F; (b) (c) F;
(d) (e) F; (f)
2. (a) V; (b) (c) F; (d)
(e) V; (f) (g) F; (h)
3. (a) V; (b) (c) V;
(d) (e) F; (f)
(g) F; (h) (i) F.
4. (a) V; (b) (c) F; (d)
(e) V; (f) (g) F.
5. (a) V; (b) (c) V; (d)
(e) V; (f) (g) F; (h)
(i) V; (j) (k) V.
6. (a) $\mathbb{Q}_+ = \{x \in \mathbb{Q} \mid x \geq 0\}$ = racionais não negativos.
(b)
(c) $\mathbb{Q}_+^* = \{x \in \mathbb{Q} \mid x > 0\}$ = racionais positivos.
(d)
(e) $\mathbb{Q}^* = \{x \in \mathbb{Q} \mid x \neq 0\}$ = racionais não nulos.
(f)
(g) $\mathbb{R}_+ = \{x \in \mathbb{R} \mid x \geq 0\}$ = reais não negativos.
(h)
(i) $\mathbb{R}_- = \{x \in \mathbb{R} \mid x \leq 0\}$ = reais não positivos.
(j)

7.

(a) $B = \{x \in \mathbb{R} \mid 0 < x \leq 3\} = (0, 3]$.



(b) $D = \{x \in \mathbb{R} \mid \frac{3}{4} < x < 1\} = (\frac{3}{4}, 1)$.



(c) $F = \{x \in \mathbb{R} \mid \sqrt{2} \leq x < \frac{3}{2}\} = [\sqrt{2}, \frac{3}{2})$.



(d) $H = \{x \in \mathbb{R} \mid x < \frac{7}{3} \text{ ou } x > 3\}$

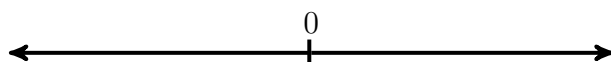
$= (-\infty, \frac{7}{3}) \cup (3, \infty)$.



(e) $J = \{x \in \mathbb{R} \mid 0 < x < 1 \text{ ou } 2 \leq x \leq 3\}$
 $= (0, 1) \cup [2, 3]$.



(f) $L = \{x \in \mathbb{R} \mid 1 \leq x \leq -2\} = \emptyset$.



8.

(a) $A \cap B = \emptyset$.

(b) $A \cup B = (\sqrt{2}, \pi]$.

(c) $A - B = A = (\sqrt{2}, 3)$.

(d) $B - A = B = [3, \pi]$.

(e) $\mathbb{C}_{\mathbb{R}}^A = \mathbb{R} - A = \bar{A} = (-\infty, \sqrt{2}] \cup [3, \infty)$.

(f) $\mathbb{C}_{\mathbb{R}}^B = \mathbb{R} - B = \bar{B} = (-\infty, 3) \cup (\pi, \infty)$.

9.

(a) $A \cap B = (-3, -\frac{2}{3}) \cup \left[\frac{\pi}{5}, \frac{\sqrt{2}}{2}\right]$.

(b) $A \cup B = (-\infty, -\frac{1}{3}) \cup \left(\frac{\sqrt{3}}{3}, \infty\right)$.

(c) $A - B = \left[-\frac{2}{3}, -\frac{1}{3}\right) \cup \left(\frac{\sqrt{2}}{2}, \infty\right)$.

(d) $B - A = (-\infty, -3] \cup \left(\frac{\sqrt{3}}{3}, \frac{\pi}{5}\right)$.

(e) $\mathbb{C}_{\mathbb{R}}^A = \mathbb{R} - A = \bar{A} = (-\infty, -3] \cup \left[-\frac{1}{3}, \frac{\pi}{5}\right)$.

(f) $\mathbb{C}_{\mathbb{R}}^B = \mathbb{R} - B = \bar{B} = \left[-\frac{2}{3}, \frac{\sqrt{3}}{3}\right] \cup \left(\frac{\sqrt{2}}{2}, \infty\right)$.

10.

(a) $A \cap B = (1, 2]$.

(b) $A \cup B = [0, 4]$.

(c) $A - B = [0, 1]$.

(d) $B - A = (2, 4]$.

(e) $\mathbb{C}_{\mathbb{R}}^A = (-\infty, 0) \cup (2, \infty)$.

(f) $A \cap C = \emptyset$.

(g) $A \cup C = [0, 2] \cup (3, 4]$.

(h) $A - C = [0, 2]$.

(i) $C - A = (3, 4]$.

(j) $\bar{B} = (-\infty, 1] \cup (4, \infty)$.

(k) $B \cap C = (3, 4]$.

(l) $B \cup C = (1, 4]$.

(m) $B - C = (1, 3]$.

(n) $C - B = \emptyset$.

(o) $C' = (-\infty, 3] \cup (4, \infty)$.

(p) $\bar{C} - \overline{A \cap B} = (1, 2]$.

11. $M = \overline{\mathbb{C}_A^C - \mathbb{C}_A^B} = (-\infty, \sqrt{5}] \cup \left(\frac{5}{2}, \pi\right]$.

12.

13.

14.

15.

16. (a) 17; (b) -7 ; (c) 4; (d) 0; (e) 27;
 (f) 9; (g) -15 ; (h) 3; (i) -16 ; (j) -11 ;
 (k) -14 ; (l) -2 ; (m) 1.
17. (a) -48 ; (b) 15; (c) -25 ; (d) 72;
 (e) 221; (f) 30; (g) -56 ; (h) 32.
18. (a) -4 ; (b) -8 ; (c) 2; (d) -3 ; (e) 4;
 (f) 5; (g) -1 ; (h) 3; (i) 1.
19. (a) -21 ; (b) -1 .
20. (a) $720 = 2^4 \cdot 3^2 \cdot 5$; (b) $546 = 2 \cdot 3 \cdot 7 \cdot 13$;
 (c) $9009 = 3^2 \cdot 7 \cdot 11 \cdot 13$.
21. (a) 1, 2, 3, 6, 9, 18; (b) 1, 2, 3, 5, 6, 9, 10, 15, 18, 30, 45, 90;
 (c) 1, 2, 3, 5, 6, 10, 15, 25, 30, 50, 75, 150.
22. (a) $\text{mdc}(70, 99) = 1$; (b) $\text{mdc}(504, 540) = 36$;
 (c) $\text{mdc}(150, 180, 240) = 30$; (d) $\text{mmc}(70, 99) = 6930$;
 (e) $\text{mmc}(504, 540) = 7560$; (f) $\text{mmc}(150, 180, 240) = 3600$.
23. (a) $\frac{8}{20} = \frac{2}{5}$; (b) $\frac{36}{45} = \frac{4}{5}$; (c) $\frac{54}{72} = \frac{3}{4}$;
 (d) $\frac{138}{46} = 3$; (e) $\frac{-51}{153} = -\frac{1}{3}$.
24. (a) $\frac{4}{9}$; (b) $-\frac{3}{5}$; (c) $\frac{13}{4}$;
 (d) $-\frac{8}{3}$; (e) $-\frac{11}{4}$; (f) $-\frac{1}{36}$;
 (g) $-\frac{5}{12}$; (h) $\frac{113}{60}$.
25. (a) $\frac{8}{27}$; (b) -1 ; (c) $\frac{10}{3}$;
 (d) $\frac{63}{256}$; (e) $-\frac{5}{48}$; (f) 1.
26. (a) $\frac{2}{7}$; (b) $\frac{21}{4}$; (c) $\frac{9}{2}$;
 (d) $-\frac{4}{3}$; (e) $-\frac{51}{70}$; (f) $\frac{1}{2}$.
27. $\frac{3}{2}$.
28. (a) 129, 357; (b) 8, 142; (c) 2, 868; (d) $-11, 47$;
 (e) 13, 2; (f) 340; (g) 24; (h) 27, 5;
 (i) 52, 156; (j) 23, 45; (k) 3, 45; (l) 6, 25;
 (m) 3, 42; (n) 32; (o) 40; (p) 5;
 (q) 20, 7.
29. (a) 1301.
 (b) $\frac{18542}{9331}$.