



MTM3100 - Pré-cálculo

Gabarito parcial da 4ª lista de exercícios

1. (a) -1 ; (b) (c) $-\frac{11}{9}$;
(d) $\frac{4 - \sqrt{2}}{\sqrt{2}} = 2\sqrt{2} - 1$;
(e) a expressão não está definida para $x = 1$.
2. (a) $9x - 7y$;
(b)
(c) $2x^2 - 2x - 2$;
(d)
(e) $8x^2 - 10xy + 3y^2$;
(f) $x^2 + x$;
(g) $-\frac{2}{3}a^3 + \frac{3}{2}a^2b - \frac{19}{30}ab^2 + \frac{2}{15}b^3$.
3. (a) $6x^5y^8$; (b)
(c) $30a^4b^6c^9$; (d)
(e) $\frac{2}{5}a^3b^4$; (f)
(g) $6x^3 - 9x^2y + 4x^2 - 6xy - 10x + 15y$; (h)
(i) $6x^3 - 7x^2 - x + 2$; (j) $2x^2 + \frac{23}{9}x - \frac{2}{3}$.
4. (a) $-28x^3 - x$;
(b) $19x^2 - 20x + 3$.
5. (a) $5x^3$; (b)
(c) $4x^2y$; (d)
(e) $2x - 3y$; (f)

6. (a) $x^2 + 10x + 21$; (b)
(c) $y^2 - \frac{5}{6}y + \frac{1}{6}$; (d) $x^2 - 4\sqrt{3}x + 9$;
(e) $x^2 + (p + q)x + pq = x^2 + px + qx + pq$.
7. (a) $x^2 - 36$; (b)
(c) (d) $9x - y^{2n}$;
(e) $x - 3$.
8. (a) $4x^2 + 12xy + 9y^2$; (b)
(c) $9x^2 + 12xy + 4y^2$; (d)
(e) $x^2 - 10x + 25$; (f)
(g) $3x^2 + 12xy + 12y^2$; (h) $a^2 + 2ab + b^2$.
9. (a) $a^2 + 2ab + b^2 - c^2$; (b) $a^2 + 2ab + b^2 - c^2 - 2cd - d^2$;
(c) (d) $x^4 + 4x^3 + 4x^2 - 9$;
(e) (f) $x^3 - a^3$;
10. (a) $a^3 + 3a^2b + 3ab^2 + b^3$; (b)
(c) (d) $27x^3 + 54x^2y + 36xy^2 + 8y^3$.
11. (a) $x^4 + 4x^3 + 6x^2 + 4x + 1$;
(b) $243x^5 - 810x^4y + 1080x^3y^2 - 720x^2y^3 + 240xy^4 - 32y^5$;
(c) $a^8 + 8a^7b + 28a^6b^2 + 56a^5b^3 + 70a^4b^4 + 56a^3b^5 + 28a^2b^6 + 8ab^7 + b^8$;
(d) $\frac{1}{64}x^6 - \frac{9}{16}x^5 + \frac{135}{16}x^4 - \frac{135}{2}x^3 + \frac{1215}{4}x^2 - 729x + 729$;
12. (a) $C_{15,5} \cdot 3^5 = 729729$; (b) $C_{7,2} \cdot 4^2 = 336$.
13. (a) $m(x + y)$; (b)
(c) $x(x - y)$; (d) $x^2y^2(y - x)$;
(e) $4(2x - 3y)$; (f)
(g) $3x^2y(2ax^2 - 3bxy + 4cy^2)$; (h) $17(2xy - 5z)$;
(i) $2x^{n-1}y^{n-1}(y^2 + 2x^2)$; (j)
(k) $(a + m)(x + y)$.
14. (a) $(a + b)(a - b)$; (b)
(c) (d) $(x + \sqrt{5})(x - \sqrt{5})$;
(e) $\left(\frac{x}{6} + \frac{11}{y}\right)\left(\frac{x}{6} - \frac{11}{y}\right)$; (f) $(a + \sqrt[4]{2})(a - \sqrt[4]{2})$;
(g) $(a + 0, 3)(a - 0, 3)$; (h) $(7x^3y + 1)(7x^3y - 1)$;
(i) $(x^2 + y^2)(x + y)(x - y)$.

15. (a) $(x + 3y)^2$; (b)
(c) $(2x - 3)^2$; (d)
(e) $(x^3 + 7y)^2$; (f)
(g) (h) $(x - 5y)^2$.
16. (a) $(a + 2)(a^2 - 2a + 4)$ (b)
(c) $(7x + 2)(49x^2 - 14x + 4)$; (d) $(6x^2 - 5y)(36x^4 + 30x^2y + 25y^2)$;
(e) (f) $xy(x + y)(x^2 - xy + y^2)$.
17. (a) $(x + 5)(x + 2)$; (b) $(a + 8)(a + 1)$;
(c) (d) $(x + 3)(x - 6)$.
18. (a) $x^2 - 4x + 7 = x^2 - 4x + 4 + 3 = (x - 2)^2 + 3$;
(b) $2x^2 - 6x - 4 = 2\left(x^2 - 3x + \frac{9}{4}\right) - \frac{17}{2} = 2\left(x - \frac{3}{2}\right)^2 - \frac{17}{2}$;
(c) $(x + 1)^2 + 1$; (d) (e) $-(x + 1)^2 - 8$;
(f) $-\left(x - \frac{3}{10}\right)^2 - \frac{51}{20}$; (g) (h) $\left(x - \frac{3}{8}\right)^2 - \frac{1}{64}$.