Lista para Recordar Conceitos Básicos - parte 1
Cálculo Diferencial e Integral I - Licenciatura Química -2013
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1. Calcule

   (a) $2^2 =$

   (b) $3^2 =$

   (c) $2^3 =$

   (d) $3^3 =$

   (e) $3^0 =$

   (f) $3^1 =$

   (g) $4^0 =$

   (h) $4^1 =$

   (i) $(-2)^2 =$

   (j) $(-2)^3 =$

   (k) $(-2)^0 =$

   (l) $(-2)^1 =$

   (m) $(a)^1 =$

   (n) $2^3 \cdot 2^5 =$

   (o) $(-2)^2 \cdot (-2)^5 =$

   (p) $(-2)^4 \cdot (2)^5 =$

   (q) $2^{2^3} =$

   (r) $(2^2)^3 =$

2. Calcule

   (a) $0^{12} =$

   (b) $0^{-3} =$

   (c) $3^{-1} =$

   (d) $2^{-3} =$

   (e) $2^2 \cdot 2^{-3} =$

   (f) $\dfrac{2^3}{2^5} =$

(g) $2^{1/3} =$

(h) $64^{1/2} =$

(i) $64^{1/3} =$

(j) $27^{1/3} =$

(k) $64^{-1/2} =$

(l) $64^{-1/3} =$

(m) $27^{-1/3} =$

(n) $\sqrt[3]{-27} =$

(o) $-27^{-1/3} =$

3. Calcule

(a) $\dfrac{2}{5} + \dfrac{3}{5} =$

(b) $\dfrac{2}{7} + \dfrac{3}{5} =$

(c) $\dfrac{2}{7} + \dfrac{2}{5} =$

(d) $\dfrac{1}{2} + \dfrac{3}{4} =$

(e) $\dfrac{5}{3} - \dfrac{7}{3} =$

(f) $\dfrac{3}{4} - \dfrac{7}{3} =$

(g) $\dfrac{a}{b} + \dfrac{b}{c} = \qquad (b \neq 0, c \neq 0)$

(h) $\dfrac{a+d}{d+e} + \dfrac{d+a}{f+g} = \qquad (d+e \neq 0, f+g \neq 0)$

(i) $\dfrac{5}{3} \cdot \dfrac{4}{2} =$

(j) $\dfrac{4}{3} \cdot \dfrac{7}{4} =$

(k) $\dfrac{a}{b} \cdot \dfrac{b}{c} = \qquad (b \neq 0, c \neq 0)$

(l) $\dfrac{a}{b} \cdot \dfrac{c}{a} = \qquad (b \neq 0, a \neq 0)$

(m) $\dfrac{4}{5} \div \dfrac{3}{2} =$

(n) $\dfrac{7}{8} \div \dfrac{6}{5} =$

(o) $\dfrac{2}{3} \div \dfrac{3}{2} =$

(p) $\dfrac{a}{b} \div \dfrac{c}{d} =$ $(b \neq 0, d \neq 0, c \neq 0)$

4. Calcule

   (a) $a^{1/2} \cdot a^{-1/2} =$

   (b) $a^{1/2} \cdot a^{2} =$

   (c) $a^{1/2} \div a^{-1/2} =$

   (d) $a^{1/2} \div a^{1/2} =$

   (e) $a^{1/2} \div a^{2} =$

5. Dados os polinômios A $= x^2 - 6x + 10$, B $= 3x^3 - 7x^2 + x + 1$ e C $= 4x^2 - 6$. Calcule

   (a) A+B

   (b) A-C

   (c) A+B+C

   (d) A-B

   (e) B.C

   (f) (A+B).C

6. Fatore

   (a) $2x + 6x$

   (b) $3y + 9y$

   (c) $ab + a + b + 1$

   (d) $25x^2 + 70x + 49$

   (e) $a^3 - 10a^2 + 25a$

   (f) $y^3 + y^2 - 3y - 3$

   (g) $934.287^2 - 934.286^2$

7. Encontre os valores de x que satisfazem a equação

   (a) $3x - (2 - (x - 1)) = 5x$

   (b) $2x - (1 - (x - 2)) = 3$

   (c) $2(x - 7) = x - (2 - x)$

   (d) $6x^2 - x - 1 = 0$

   (e) $x^2 - 49 = 0$

(f) $3x^2 + 12x = 0$

(g) $x^2 - 5x + 6 = 0$

8. Resolver em $\mathbb{R}$ as seguintes equações:

   (a) $\sqrt{x+10} - \sqrt{x+3} = \sqrt{4x-23}$

   (b) $\sqrt{4x-3a} - \sqrt{x+6a} = \sqrt{x-3a}$

9. Simplifique as expressões

   (a) $\dfrac{x^2 - 1}{x - 1} =$

   (b) $\dfrac{x^2 + 4x + 3}{x + 1} =$

   (c) $\dfrac{6x^2 - 13x + 6}{x - \frac{2}{3}} =$

10. Resolver em $\mathbb{R}$ as seguintes inequações-produto

    (a) $(x+2)(2x-1) > 0$

    (b) $(3x-2)(x+1)(3-x) < 0$

    (c) $(3x+1)(2x-5) \geq 0$

    (d) $(6x-1)(2x+7) \geq 0$

    (e) $(3-2x)(4x+1)(5x+3) \geq 0$

    (f) $(3x+2)(-3x+4)(x-6) < 0$

    (g) $(3x+1)^3(2-5x)^5(x+4)^8 > 0$

    (h) $(x+6)^7(6x-2)^4(4x+5)^{10} \leq 0$

    (i) $(5x+4)^4(7x-2)^3 \geq 0$

    (j) $(3x+1)^3(2-5x)^5(x+4)^{10} \leq 0$

    (k) $(x+6)^7(6x-2)^4(4x+5)^{10} \geq 0$

11. Resolva as seguintes inequações (a resposta deve ser dada na forma de conjunto solução)

    (a) $3(y-5) - 4(y+6) \leq 7$

    (b) $-8 \leq 2x - 7 \leq 5$

    (c) $x^2 - 8x \leq 20$

    (d) $2x^2 + 2 \geq 5x$

(e) $x^3 < x^2 + 6x$

(f) $\dfrac{x+5}{x-3} \leq 0$

(g) $\dfrac{2x}{x-3} \geq 3$

12. Resolver em $\mathbb{R}$ as seguintes inequações:

    (a) $\frac{4x^2+x-5}{2x^2-3x-2} > 0$

    (b) $\frac{-9x^2+9x-2}{3x^2+7x+2} \leq 0$

    (c) $\frac{x^2+2x}{-x^2+7x-10} \geq 1$

13. Calcule

    (a) $|-5| =$

    (b) para $a < 0$ encontre $|a|$.

    (c) para $a > 0$ encontre $|a|$.

    (d) $|3 - 5| =$

    (e) $|3| - |5| =$

    (f) $|3.5| =$

    (g) $|3|.|5| =$

14. Resolver as seguintes equações em $\mathbb{R}$:

    (a) $|x + 2| = 3$

    (b) $|x^2 - 3x - 1| = 3$

    (c) $|x^2 - 4x + 5| = 2$

15. Resolva

    (a) $|x + 3| = 5$

    (b) $|x - 4| = |3x + 1|$

    (c) $|x - 5| > 3$

    (d) $|x + 1| < |2x + 1|$

16. Resolver em $\mathbb{R}$ as seguintes inequações:

    (a) $\frac{x+1}{x+2} > \frac{x+3}{x+4}$

(b) $\frac{1}{x-1} + \frac{2}{x-2} - \frac{3}{x-3} < 0$

(c) $\frac{2}{3x-1} \geq \frac{1}{x-1} - \frac{1}{x+1}$

(d) $|x+2| - |x-3| > x$

(e) $|x-2| - |x+3| > x^2 - 4x + 3$

(f) $\sqrt{x+5} < x - 1$

(g) $\sqrt{6-x} \geq x$

(h) $\frac{\sqrt{3-x}}{x} \leq 2$