Efetuar as operações indicadas:

1) $(4b+3c-a) + (4a-3b-2c) = 3b + c + 3a = 3a+c+b$

2) $(5ab-3c+4d) + (-2d+3c-4ab) = ab + 2d$

3) $(xy-3x^2+1) + (3+5x^2-3xy) = -2xy + 2x^2 + 4$

4) $\left(\frac{1}{2}xy^2 - 2x + y\right) + \left(4x - 2y + \frac{1}{4}x^2y\right) = \frac{1}{2}xy^2 + 2x - y + \frac{1}{4}x^2y$

5) $(5xy-x^3+4y) + (5+2x^3-4y-6xy) = -1xy + x^3 + 5$

6) $(10x+20y) - (5x+15y) = 10x + 20y - 5x - 15y = 5x+5y$

7) $(xy^3-2xy+1) - (4xy+5+2xy^3) = xy^3 - 2xy + 1 - 4xy - 5 - 2xy^3 = -xy^3 - 6xy - 4$

8) $(x^2+2xy+3y^2) - (x^2-2xy+3y^2) = x^2 + 2xy + 3y^2 - x^2 + 2xy - 3y^2 = 4xy$

9) $(-x^3+2xy+4) - (2x^3+2xy+8) = -x^3 + 2xy + 4 - 2x^3 - 2xy - 8 = -3x^3 - 4$

10) $\left(\frac{3}{5}x^2y - 2zh\right) + \left(1 + 2zh + \frac{2}{5}x^2y\right) - (x^2y + 1)$

$\frac{3}{5}x^2y - 2zh + 1 + 2zh + \frac{2}{5}x^2y - x^2y - 1 = \frac{5}{5}x^2y - x^2y = 0$

$1x^2y - x^2y = 0$

11) $(5a)(-7) = -35a$

12) $(4ab)(-7ab^2) = -28a^2b^3$

13) $(x+y^2+4)(x+1) = x^2 + x + y^2x + y^2 + 4x + 4 = x^2 + 5x + y^2x + y^2 + 4$

14) $(4x-3y)(4x+3y) = 16x^2 + 12xy - 12yx - 9y^2 = 16x^2 - 9y^2$

15) $(x+3)(x+3) = x^2 + 3x + 3x + 9 = x^2 + 6x + 9$

$\frac{a^2}{a^4} = \frac{a \cdot a}{a \cdot a \cdot a \cdot a} =$

16) $(8x^2) : (4x^2) = \frac{8x^2}{4x^2} = 2 \cdot 1 = 2$

17) $(xy) : (4xy^2) = \frac{xy}{4xy^2} = \frac{1}{4y}$

18) $(3a^2b^4) : (5a^4b^2) = \frac{3a^2b^4}{5a^4b^2} = \frac{3b^2}{5a^2}$

19) $(5x^2y^3+4x^2y-3xy^2) : (2xy) = \frac{5x^2y^3+4x^2y-3xy^2}{2xy} =$

$= \frac{5x^2y^3}{2xy} + \frac{4x^2y}{2xy} - \frac{3xy^2}{2xy} = \frac{5xy^2}{2} + 2x - \frac{3y}{2}$

Desenvolver os produtos indicados:

1) $(1+i)^2 = 1^2 + 2 \cdot 1 \cdot i + i^2 = 1 + 2i + i^2$

2) $(2x+5)^2 = (2x)^2 + 2 \cdot 2x \cdot 5 + 5^2 = 4x^2 + 20x + 25$

3) $\left(\frac{x}{2}+\frac{1}{4}\right)^2 = \left(\frac{x}{2}\right)^2 + \frac{2}{1}\cdot\frac{x}{2}\cdot\frac{1}{4} + \left(\frac{1}{4}\right)^2 = \frac{x^2}{4} + \frac{2x}{8} + \frac{1}{16}$

($a = \frac{x}{2}$, $b = \frac{1}{4}$)

4) $(3x+4y)^2 = (3x)^2 + 2 \cdot 3x \cdot 4y + (4y)^2 = 9x^2 + 24xy + 16y^2$

($a = 3x$, $b = 4y$)

5) $(\sqrt{2}-x)^2 = (\sqrt{2})^2 - 2\sqrt{2} \cdot x + x^2 = 2 - 2\sqrt{2}x + x^2$

($a = \sqrt{2}$, $b = x$)

6) $(3x-y)^2 = (3x)^2 - 2 \cdot 3xy + y^2 = 9x^2 - 6xy + y^2$

($a = 3x$, $b = y$)

7) $\left(\frac{1}{x}-2y\right)^2 = \left(\frac{1}{x}\right)^2 - 2\cdot\frac{1}{x}\cdot 2y + (2y)^2 = \frac{1}{x^2} - \frac{4y}{x} + 4y^2$

(a = $\frac{1}{x}$, b = $2y$)

8)(5x+1)(5x-1) $= (5x)^2 - 1^2 = 25x^2 - 1$

9)$(2x^2+1)(2x^2-1)$ $= (2x^2)^2 - 1^2 = 4x^4 - 1$

10) $(\sqrt{x}+y)(\sqrt{x}-y)$ $= (\sqrt{x})^2 - y^2 = x - y^2$

11) $(y-5)^2$ $= y^2 - 2y\cdot 5 + 5^2 = y^2 - 10y + 25$

12) $(x+2)^2$ $= x^2 + 2\cdot x\cdot 2 + 2^2 = x^2 + 4x + 4$

13) $(3x-2)(3x+2)$ $= (3x)^2 - 2^2 = 9x^2 - 4$

https://youtu.be/AqEWLuOHV9I

- $\frac{10}{5} = \frac{5\cdot 2}{5} = 2$
- $\frac{15}{9} = \frac{5\cdot 3}{3\cdot 3} = \frac{5}{3}$
- $\frac{10x^2y^3}{5xy} = 2xy^2$
- $\frac{x^2-4x+4}{x-2} = x-2$; $x \neq 0$

- $\frac{20\cdot x^4\cdot y^5}{15\cdot x^6\cdot y^4} = \frac{4\cdot y}{3\cdot x^2}$

$\frac{3+5}{3} \neq 5$ $\quad \frac{3+5}{3} = \frac{8}{3}$

https://youtu.be/57C0PQ6WZng

$a^2 - b^2 = (a+b)(a-b)$

Simplificar as expressões:

1) $\frac{3x^4 - 10x^2}{x^5 - x^2} = \frac{x^2(3x^2 - 10)}{x^2(x^3 - 1)} = \frac{3x^2 - 10}{x^3 - 1}$

2) $\frac{x^2 - 16}{x + 4} = \frac{(x+4).(x-4)}{x+4} = x - 4$

3) $\frac{2x - 2}{(x-1)^2} = \frac{2(x-1)}{(x-1).(x-1)} = \frac{2}{x-1}$

4) $\frac{(x+3)^2}{x^2 - 9}$

5) $\frac{x^2 - 9}{x - 3}$

6) $\frac{x + 7}{x^2 - 49}$

7) $\frac{x^2 + 10x + 25}{x + 5} = \frac{(x+5)(x+5)}{x+5} = x + 5$

$x^2 + 10x + 25$

$a = 1 \quad b = 10 \quad c = 25$

$\Delta = b^2 - 4.1.25$

$\Delta = 100 - 100 = 0$

$x = \frac{-10 \pm \sqrt{0}}{2.1}$

$x = \frac{-10 \pm 0}{2} \begin{matrix} \nearrow -5 \\ \searrow -5 \end{matrix}$

$(x - x_1)(x - x_2)$

$(x+5)(x+5)$

8) $\frac{x^2 - 36}{(x-6)^2}$

9) $\frac{x^2 + 6x}{x^2 - 36}$

10) $\frac{4x + 6}{2x}$

11) $\frac{x^2 + 6x + 9}{2x + 6}$

12) $\frac{2x + 14}{49 - x^2}$

13) $\frac{x^2 - 12x + 36}{(x-6)^2}$