FRACCIONES ALGEBRAICAS

1.- Suma las siguientes fracciones algebraicas:

$$\frac{x^2+1}{x+1}+\frac{x-3}{x^5-1}= \qquad \text{sol: } \frac{x^7+x^5+2x^2-2x-2}{x^6+x^5+x+1}$$

2.- Opera y simplifica: $\frac{x^2}{x+1}+\frac{x+6}{x^3+3x^2+3x+1}=$ sol: $\frac{x^4+2x^3+x^2+x+6}{(x+1)^3}$

3.- Opera y simplifica: $\frac{2x+3}{x^3+1}-\frac{x^2+3}{x^2-1}=$ sol: $\frac{-x^5-x^3-4x^2-2x}{(x^3+1)(x^2-1)}$

4.- Opera y simplifica: $\frac{x+1}{x^2-1}\cdot\frac{x}{x^2+1}=$ sol: $\frac{x}{x^3-x^2+x-1}$

5.- Opera y simplifica:

a) $\frac{x-1}{x^2}\div\frac{4}{3x+2}=$ sol: $\frac{3x^2-3x-2}{4x^2}$

b) $\frac{3x-y}{2}+\frac{6x+y}{4}+\frac{y-2x}{6}=$ sol: $\frac{32x-y}{12}$

c) $\frac{x}{y}+\frac{y}{x}+\frac{x+y}{x-y}=$ sol: $\frac{x^3+2xy^2-y^3}{xy(x-y)}$

d) $\frac{2a-3b}{a-b}+\frac{4a+b}{a+b}+\frac{ab-3a^2+4b^2}{a^2-b^2}=$ sol: $\frac{3a}{a+b}$

e) $\frac{3x}{x-2}-\frac{5x}{x+2}-\frac{6x^2}{x^2-4}=$ sol: $\frac{8x}{x+2}$

f) $\frac{3x^2y}{7m^2n^3}\cdot\frac{4m^2n^4}{5a^2bc^2}\cdot\frac{6a^3b^3c}{4xy^3}=$ sol: $\frac{18ab^2xn}{35cy^2}$

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

h) $\frac{-14x^2}{x^3-16x}+\frac{x+3}{x-4}-\frac{x-3}{x+4}=$ sol: 0

i) $\left(1-\frac{a-\frac{x}{y}}{b-\frac{x}{y}}\right):\left(1-\frac{b+\frac{x}{y}}{a+\frac{x}{y}}\right)=$ sol: $\frac{x+ay}{x-by}$

j) $\frac{1+\frac{a-b}{a+b}}{\frac{a+b}{a-b}-1}:\frac{\frac{1}{a}-\frac{1}{b}}{\frac{a+b}{a}-\frac{a+b}{b}}=$ sol: $\frac{a(a-b)}{b}$

k) $\frac{x^2-y^2}{\frac{1}{x}+\frac{1}{y}}\cdot\frac{x-\frac{x^2}{x+y}}{y-\frac{y^2}{x+y}}\cdot\frac{\frac{1}{x}-\frac{1}{y}}{\frac{1}{x}+\frac{1}{y}}=$ sol: $-\frac{xy(x-y)^2}{x+y}$

l) $\left[\frac{\frac{2x}{x-y}}{\frac{4x}{x^2+2xy+y^2}}:\frac{\frac{x}{x+y}}{\frac{1}{x^2-y^2}}\right]^2:\left[\frac{1+\frac{y}{x}}{1-\frac{y}{x}}\right]^4=$ sol: $\frac{1}{4x^2}$