ALGEBRAIC FRACTIONS 1

1.- Simplify, factorising (if possible) numerator and denominator:

a) $\frac{4x^2-16}{8x+16}=$

b) $\frac{3x^2-18x+27}{6x^2-54}=$

c) $\frac{2x^3-8x^2+8x}{6x^4-24x^3}=$

2.- Work out and simplify:

a) $\frac{x^2-4}{x^2-2x+1}\cdot\frac{2x-2}{6x+12}=$

b) $\frac{x^2-4}{x^2-4x+4}\cdot\frac{2x-4}{(x+2)^2}=$

c) $\frac{x^2-9}{8x^2}\div\frac{x-3}{4x^3}=$

d) $\frac{x^2-6x+9}{8x+16}\div\frac{x^2-9}{4x+8}=$

e) $\frac{x^2-1}{8x}+\frac{x-1}{x}=$

f) $\frac{x^2+1}{2(x-1)}-\frac{x}{x-1}=$

SOLUTION

1.- Simplify, factorising (if possible) numerator and denominator:

a) $\frac{4x^2-16}{8x+16}=\frac{4(x^2-4)}{8(x+2)}=\frac{4(x-2)(x+2)}{8(x+2)}=\frac{x-2}{2}$

b) $\frac{3x^2-18x+27}{6x^2-54}=\frac{3(x^2-6x+9)}{6(x^2-9)}=\frac{3(x-3)^2}{6(x+3)(x-3)}=\frac{x-3}{2(x+3)}$

c) $\frac{2x^3-8x^2+8x}{6x^4-24x^3}=\frac{2x(x^2-4x+4)}{6x^2(x^2-4)}=\frac{(x-2)^2}{3x(x+2)(x-2)}=\frac{x-2}{3x(x+2)}$

2.- Work out and simplify:

a) $\frac{x^2-4}{x^2-2x+1}\cdot\frac{2x-2}{6x+12}=\frac{(x+2)(x-2)\cdot 2(x-1)}{(x-1)^2\cdot 6(x+2)}=\frac{x-2}{3(x-1)}$

b) $\frac{x^2-4}{x^2-4x+4}\cdot\frac{2x-4}{(x+2)^2}=\frac{(x+2)(x-2)\cdot 2(x-2)}{(x-2)^2(x+2)^2}=\frac{2}{x+2}$

c) $\frac{x^2-9}{8x^2}\div\frac{x-3}{4x^3}=\frac{(x^2-9)\cdot 4x^3}{8x^2\cdot(x-3)}=\frac{(x+3)(x-3)x}{2(x-3)}=\frac{x(x+3)}{2}$

d) $\frac{x^2-6x+9}{8x+16}\div\frac{x^2-9}{4x+8}=\frac{(x^2-6x+9)(4x+8)}{(8x+16)(x^2-9)}=\frac{(x-3)^2 4(x+2)}{8(x+2)(x+3)(x-3)}=$

$=\frac{(x-3)}{2(x+3)}=\frac{x-3}{2x+6}$

e) $\frac{x^2-1}{8x}+\frac{x-1}{x}=\frac{x^2-1}{8x}+\frac{8x-8}{8x}=\frac{x^2+7x-8}{8x}$

$LCF=8x$

f) $\frac{x^2+1}{2(x-1)}-\frac{x}{x-1}=\frac{x^2+1-2x}{2(x-1)}=\frac{(x-1)^2}{2(x-1)}=\frac{x-1}{2}$

$LCF=2(x-1)$