Algebraic Fractions

1) Always **FACTORISE FIRST**

2) Only cancel ( ), not parts of them

e.g. $(i)\ \dfrac{16a^3b^2c}{24ab^3c^3} = \dfrac{2a^2}{3bc^2}$

$(ii)\ \dfrac{ap^2-aq^2}{2ap-2aq} = \dfrac{a(p^2-q^2)}{2a(p-q)}$

$= \dfrac{a(p-q)(p+q)}{2a(p-q)}$

$= \dfrac{(p+q)}{2}$

$$(iii)\ \frac{9x^2-1}{3x+1}\times\frac{x+1}{3x^2+2x-1}$$

$$=\frac{(3x+1)(3x-1)}{(3x+1)}\times\frac{(x+1)}{(3x-1)(x+1)}$$

$$=1$$

$$(iv)\ \frac{ab-2b^2}{6a^2b}\div\frac{a^2-4ab+4b^2}{3a}$$

$$=\frac{b(a-2b)}{6a^2b}\times\frac{3a}{(a-2b)^2}$$

$$=\frac{1}{2a(a-2b)}$$

$$(v)\ \frac{a+1}{a^2-a}-\frac{a-1}{a^2+a}$$

$$=\frac{(a+1)}{a(a-1)}-\frac{(a-1)}{a(a+1)}$$

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

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

$$=\frac{4a}{a(a-1)(a+1)}$$

$$=\frac{4}{(a-1)(a+1)}$$

1. create a common denominator
"if its not there, put it down"

2. compare the old denominator with the new denominator, and ask yourself;
"what's different?"

3. that is what you multiply the numerator by

$$(vi)\ \frac{1}{(x+y)^2}+\frac{1}{(x-y)^2}-\frac{2}{x^2-y^2}$$

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

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

$$=\frac{x^2-2xy+y^2+x^2+2xy+y^2-2x^2+2y^2}{(x+y)^2(x-y)^2}$$

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

Exercise 1D; 1e, 2ch, 3eh, 4e, 5c, 6fi, 7cf, 8ac, 9cd, 10bdf, 11acegj, 13ad*, 14bc*