

Algebraic Fractions

1) Always **FACTORISE FIRST**

2) Only cancel (), not parts of them

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

(ii)
$$\begin{aligned} \frac{ap^2 - aq^2}{2ap - 2aq} &= \frac{a(p^2 - q^2)}{2a(p - q)} \\ &= \frac{a(p - q)(p + q)}{2a(p - q)} \\ &= \frac{(p + q)}{\underline{2}} \end{aligned}$$

$$\begin{aligned} (iii) \quad & \frac{9x^2 - 1}{3x + 1} \times \frac{x + 1}{3x^2 + 2x - 1} \\ &= \frac{(3x + 1)(3x - 1)}{(3x + 1)} \times \frac{(x + 1)}{(3x - 1)(x + 1)} \\ &= \underline{1} \end{aligned}$$

$$\begin{aligned} (iv) \quad & \frac{ab - 2b^2}{6a^2b} \div \frac{a^2 - 4ab + 4b^2}{3a} \\ &= \frac{b(a - 2b)}{6a^2b} \times \frac{3a}{(a - 2b)^2} \\ &= \underline{\frac{1}{2a(a - 2b)}} \end{aligned}$$

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

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

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

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

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

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

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

$$\begin{aligned}
(vi) \quad & \frac{1}{(x+y)^2} + \frac{1}{(x-y)^2} - \frac{2}{x^2 - y^2} \\
= & \frac{1}{(x+y)^2} + \frac{1}{(x-y)^2} - \frac{2}{(x+y)(x-y)} \\
= & \frac{(x-y)^2 + (x+y)^2 - 2(x+y)(x-y)}{(x+y)^2(x-y)^2} \\
= & \frac{x^2 - 2xy + y^2 + x^2 + 2xy + y^2 - 2x^2 + 2y^2}{(x+y)^2(x-y)^2} \\
= & \frac{4y^2}{(x+y)^2(x-y)^2}
\end{aligned}$$

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