

ALGEBRAIC FRACTIONS

Multiplying Algebraic fractions

To multiply algebraic fractions:

- factorise any algebraic expression
- write as a single fraction.
- cancel any common factors.

Adding/Subtracting Algebraic fractions

To add / subtract fractions:

- factorise all algebraic expressions.
- write each with a common denominator.
- Add/subtract to get a single fraction
- Simplify numerator
- cancel common factors.

Partial fractions with repeated factors

A single fraction with a repeated linear factor in the denominator can be split into two or more separate fractions.

$$\frac{2x+9}{(x-5)(x+3)^2} \equiv \frac{A}{x-5} + \frac{B}{x+3} + \frac{C}{(x+3)^2}$$

Dividing Algebraic fractions

To divide algebraic fractions:

- Flip the second fraction and change to a multiplication.
- factorise any algebraic expression
- write as a single fraction.
- cancel any common factors.

Partial fractions

A single fraction with two distinct linear factors in the denominator be split into two separate fractions with linear denominators.

$$\frac{5}{(x+1)(x-4)} \equiv \frac{A}{x+1} + \frac{B}{x-4}$$

The method of partial fractions can also be used when there are more than two distinct linear factors in the denominator

Improper fractions

An improper fraction is one where the numerator has a degree equal to or larger than the denominator. An improper fraction must be converted to a mixed fraction before you can express in partial fractions.

$$\frac{x^3 + x^2 - 7}{x-3} \equiv Ax^2 + Bx + C + \frac{D}{x-3}$$

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