

Simplifying Algebraic Fractions involving Quadratics

Starter

1. **(Review of last lesson)** Simplify: (a) $\frac{6xy - 6x}{3y - 3}$ (b) $\frac{15xz + 5z}{25xyz - 35yz}$
2. (a) Factorise: (i) $x^2 - 16$ (ii) $x^2 + 8x + 16$
(b) Hence simplify $\frac{x^2 - 16}{x^2 + 8x + 16}$

Notes

For algebraic fractions with quadratic expressions, factorise the quadratics first, then look for any factors, especially brackets, that can be cancelled.

Factorise then cancel.

E.g. 1 Simplify: (a) $\frac{x^2 + 7x + 10}{x^2 + 2x - 15}$ (b) $\frac{x^2 - 7x + 12}{x^2 - 2x - 8}$ (c) $\frac{2x^2 - 7x - 4}{x^2 + x - 20}$

Working: (a) $x^2 + 7x + 10 = x^2 + 5x + 2x + 10 = x(x + 5) + 2(x + 5) = (x + 5)(x + 2)$
 $x^2 + 2x - 15 = x^2 + 5x - 3x - 15 = x(x + 5) - 3(x + 5) = (x + 5)(x - 3)$
 $\frac{x^2 + 7x + 10}{x^2 + 2x - 15} = \frac{(x + 5)(x + 2)}{(x + 5)(x - 3)} = \frac{x + 2}{x - 3}$

Video: [Simplifying algebraic fractions](#)

[Solutions to Starter and E.g.s](#)

Exercise

9-1 class textbook: p517 E16.4 Qu 19-29
A*-G class textbook: p476 E16.1 Qu 19-29
9-1 homework book: p517 E16.4 Qu 3e-l
A*-G homework book: p132 E16.1 Qu 3e-l

Summary

Factorise then cancel

[Homework book answers \(only available during a lockdown\)](#)