Dividing Algebraic Fractions

Starter

1. **(Review of last lesson)** Simplify $\frac{t}{2} \times \frac{24st}{6t}$.

2. **(Review of last lesson)**
Express $\frac{x^2-3x-4}{x^2+5x+6} \times \frac{x^2+4x+4}{x-4}$ as a simplified single fraction

3. Find the value of $\frac{3}{5} \div \frac{9}{20}$.

Notes
To divide fractions turn the dividing fraction upside-down and multiply.

Success criteria — dividing algebraic fractions
1. Turn the ***dividing fraction upside down*** and ***multiply***
2. ***Factorise*** the numerator and denominator of each fraction
3. ***Cancel*** any common factor which appears at the top and bottom of ***either*** fraction.
4. ***Multiply*** what is left: numerator × numerator, denominator × denominator

E.g. 1 Simplify: (a) $\frac{4x}{y^2} \div \frac{2x}{12y^4}$ (b) $\frac{18a}{6b^2} \div \frac{a}{20b}$ (c) $\frac{3x^3y^5}{4x^5y} \div \frac{xy}{28}$

Working: (a) $\frac{4x}{y^2} \div \frac{2x}{12y^4} = \frac{4x}{y^2} \times \frac{12y^4}{2x} = \frac{24xy^4}{xy^2} = 24x^{1-1}y^{4-2} = 24y^2$

E.g. 2 Simplify: (a) $\frac{3x+6}{x^2-9} \div \frac{x+2}{x^2+4x+3}$ (b) $\frac{x^2-4x+4}{x^2+6x+5} \div \frac{2x-4}{3x+15}$

Working: (a) $3x+6 = 3(x+2)$

$x^2-9 = (x-3)(x+3)$

$x^2+4x+3 = x^2+3x+x+3 = x(x+3)+1(x+3) = (x+3)(x+1)$

$$\frac{3x+6}{x^2-9} \div \frac{x+2}{x^2+4x+3} = \frac{3x+6}{x^2-9} \times \frac{x^2+4x+3}{x+2}$$
$$= \frac{3(x+2)}{(x-3)(x+3)} \times \frac{(x+3)(x+1)}{x+2}$$
$$= \frac{3(x+1)}{(x-3)}$$

Video: Dividing algebraic fractions

Solutions to Starter and E.g.s

Exercise

9-1 class textbook:	p519 E16.5 Qu 7-14, 15ceghjl
A*-G class textbook:	p477 E16.2 Qu 7-14, 15ceghjl
9-1 homework book:	p175 E16.5 Qu 5-7, 12-14, 16
A*-G homework book:	p133 E16.2 Qu 5-7, 12-14, 16

Summary

To divide fractions turn the dividing fraction upside-down and multiply.

Dividing algebraic fractions:

1. Turn the ***dividing fraction upside down*** and ***multiply***
2. ***Factorise*** the numerator and denominator of each fraction
3. ***Cancel*** any common factor which appears at the top and bottom of ***either*** fraction.
4. ***Multiply*** what is left: numerator × numerator, denominator × denominator

Homework book answers (only available during a lockdown)