

Simplifying Algebraic Fractions

When simplifying algebraic fractions we sometimes need to **factorise** into either single or double brackets.

Memory

Single Brackets

$$3x + 12 = 3(x + 4)$$

HCF of 3x and 12

Double Brackets

When factorising **quadratics** we use **TEAM**.

$$x^2 + 5x + 6 = (x + 3)(x + 2)$$

T – **Times** to make the

E – **End Value**

A – **Add** to make the

M – **Middle** value

T – x 6

E – (1 x 6) (2 x 3) (-1 x -6) (-2 x -3)

A – + 5

M – (x + 2)(x + 3)

Literacy

Unscramble these anagrams and define the words.

napxed

limlputy

feincoeit

trafoc



Skill 1

- 1) $\frac{5y^2}{y}$
- 2) $\frac{8x^2}{2x^2}$
- 3) $\frac{2x}{4y}$
- 4) $\frac{6y}{3y}$
- 5) $\frac{5ab}{10b}$
- 6) $\frac{(2a)^2}{4a}$

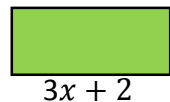
Skill 2

Simplify the following algebraic fractions. (Hint - factorise into single brackets first)

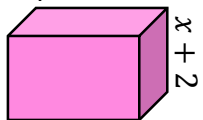
- 1) $\frac{12x-4}{36x+4}$
- 2) $\frac{5x+15}{7x+21}$
- 3) $\frac{6x^2+9x}{4x+6}$
- 4) $\frac{4p+8q}{p^2+2pq}$
- 5) $\frac{3c-c^2}{c^2}$
- 6) $\frac{w}{w^2-2w}$
- 7) $\frac{4b^2}{2ab-8b^2}$
- 8) $\frac{3mn}{m^2n-mn^2}$

Stretch 2

1) The area of the rectangle is $6x^2 + 19x + 10$. What is the height?



2) The volume of the box is represented by the expression $(x^2 + 5x + 6)(x + 5)$. Write an expression for the area of the base.



3) Prove that $\frac{x^2-9}{4x+12} = \frac{(x-3)}{4}$

Stretch 1

- 1) $\frac{4w^2-5w+1}{w^2+4w-5}$
- 2) $\frac{q^2-q-20}{2q^2+7q-4}$
- 3) $\frac{2h^2+h-3}{6h^2+7h-3}$
- 4) $\frac{2a+9ab-5b^2}{a^2+4ab-5b^2}$

Skill 4

- 1) $\frac{r^2-4}{r^2+2r-8}$
- 2) $\frac{w^2+5w-24}{w^2-6w+9}$
- 3) $\frac{t^2+4t-12}{t^2-4}$
- 4) $\frac{n^2-16}{n^2+3n-4}$
- 5) $\frac{y^2-11y+24}{y^2-7y-8}$
- 6) $\frac{x^2+7x+12}{x^2+8x+15}$
- 7) $\frac{12x-4}{36x+4}$
- 8) $\frac{y^2-9}{y^2-8y+15}$
- 9) $\frac{p^2+3p+2}{p^2-p-6}$

Skill 3

- 1) $\frac{t^2-9}{4t+12}$
- 2) $\frac{3y-12}{y^2-16}$
- 3) $\frac{w+5}{w^2-25}$
- 4) $\frac{x^2+5x+6}{3x+9}$
- 5) $\frac{t^2+7t+12}{2t^2+8t}$
- 6) $\frac{3y^2+12y}{y^2+5y+4}$