

Algebraic fractions

[CONTENTS](#)

Worked example

Simplify:

$$\frac{2x^2 - 5x - 3}{3x^2 - 11x + 6}$$

$$\frac{3x^2 - x - 10}{x^2 - 4}$$

Your turn

Simplify:

$$\frac{3x^2 - 5x - 2}{2x^2 - 7x + 6}$$

$$\frac{3x + 1}{2x - 3}$$

Worked example

Simplify:

$$\frac{x^2 - 1}{x + 1}$$

$$\frac{x - 2}{x^2 - 4}$$

$$\frac{x^2 - 9}{2x - 6}$$

Your turn

Simplify:

$$\frac{2x + 8}{x^2 - 16}$$
$$\frac{2}{x - 4}$$

Worked example

Simplify:

$$\frac{3x^2 - 10x - 8}{6x^2 + 37x - 35} \div \frac{x^2 - 3x - 4}{x^2 - 49}$$

Your turn

Simplify:

$$\frac{2x^2 - 7x - 15}{3x^2 + 10x - 8} \div \frac{2x^2 + x - 3}{x^2 - 16}$$

$$\frac{(x - 5)(x - 4)}{(3x - 2)(x - 1)}$$

Worked example

Simplify:

$$\frac{2x^3 + 5x^2 - 3x}{4x^2 - 1}$$

Your turn

Simplify:

$$\frac{3x^3 - x^2 - 10x}{9x^2 - 25}$$

$$\frac{x(x - 2)}{3x - 5}$$

Worked example

Write as a single fraction:

$$\frac{5x + 2}{3} - \frac{x - 3}{2}$$

$$\frac{x - 5}{4} - \frac{2x + 1}{3}$$

Your turn

Simplify:

$$\frac{4x + 5}{2} - \frac{x - 1}{3}$$
$$\frac{10x + 17}{6}$$

Worked example

Write as a single fraction:

$$\frac{5x + 2}{3} - \frac{2}{x - 3}$$

$$\frac{x - 5}{4} - \frac{3}{2x + 1}$$

Your turn

Simplify:

$$\frac{4x + 5}{2} - \frac{3}{x - 1}$$
$$\frac{4x^2 + x - 11}{2(x - 1)}$$

Worked example

Write as a single fraction:

$$\frac{3}{5x+2} - \frac{2}{x-3}$$

$$\frac{4}{x-5} - \frac{3}{2x+1}$$

Your turn

Simplify:

$$\frac{2}{4x+5} - \frac{3}{x-1}$$
$$\frac{-10x - 17}{(4x+5)(x-1)}$$

Worked example

Write as a single fraction:

$$\frac{3}{(5x + 2)(x - 3)} - \frac{2}{x - 3}$$

$$\frac{4}{(2x + 1)(x - 5)} - \frac{3}{2x + 1}$$

Your turn

Simplify:

$$\frac{2}{4x - 5} - \frac{3}{(x - 1)(4x - 5)}$$

$$\frac{2x - 5}{(x - 1)(4x - 5)}$$

Worked example

Write as a single fraction:

$$3 + \frac{5}{2x - 1}$$

$$2 - \frac{3}{5x + 4}$$

Your turn

Write as a single fraction:

$$5 - \frac{3}{x + 2}$$

$$\frac{5x + 7}{x + 2}$$

Worked example

Write as a single fraction:

$$3 - (x - 4) \div \frac{x^2 - 16}{x - 5}$$

Your turn

Write as a single simplified fraction:

$$5 - (x - 2) \div \frac{x^2 - 4}{x + 3}$$
$$\frac{4x + 7}{x - 2}$$

Worked example

Write in the form $1 + \frac{a}{x+b}$:

$$\frac{x+3}{x-5}$$

$$\frac{x-2}{x+7}$$

Your turn

Write in the form $1 + \frac{a}{x+b}$:

$$\frac{x-5}{x+2}$$

$$1 - \frac{7}{x+2}$$

Worked example

Simplify:

$$\frac{\frac{3}{x} + 2}{1 + \frac{5}{x}}$$

$$\frac{\frac{3}{2x} - 2}{1 - \frac{5}{2x}}$$

Your turn

Simplify:

$$\frac{\frac{5}{3x} + 3}{7 + \frac{2}{3x}}$$

$$\frac{9x + 5}{21x + 2}$$

Worked example

Solve:

$$\frac{7x}{2} - \frac{3x}{5} = 4$$

Your turn

Solve:

$$\frac{2x}{3} - \frac{3x}{4} = 5$$

$$x = -60$$

Worked example

Solve:

$$\frac{x+3}{2} - \frac{x+4}{5} = 6$$

Your turn

Solve:

$$\frac{x+5}{3} - \frac{x+6}{4} = 2$$

$$x = \frac{22}{7}$$

Worked example

Solve:

$$\frac{x+3}{2} - \frac{5}{x+4} = 6$$

Your turn

Solve:

$$\frac{x+5}{3} - \frac{4}{x+6} = 2$$

$$x = \frac{-5 - \sqrt{97}}{2}, x = \frac{-5 + \sqrt{97}}{2}$$

Worked example

Solve:

$$\frac{x+3}{x+4} - \frac{2}{x+5} = 7$$

Your turn

Solve:

$$\frac{x+5}{x+4} - \frac{6}{x+3} = 2$$

$$x = -6 - \sqrt{3}, x = -6 + \sqrt{3}$$