Algebraic Fractions

GCSE Maths · Higher tier · 20 questions · 63 marks

Name _____ Date _____ Score _____ / 63

Start at Level 1 and climb. Stuck? The worked answers show every step.

Level 1 · Warm-up **Level 2 · Build** **Level 3 · Exam-style** **Level 4 · Challenge**

Level 1 · Warm-up

10 marks

Cancelling common factors, and adding simple fractions.

1 Simplify $\frac{6x^2}{9x}$. [1 mark]

Answer _____

2 Simplify $\frac{3x+6}{x+2}$. [2 marks]

Answer _____

3 Simplify $\frac{x^2+5x}{x^2-25}$. [3 marks]

Answer _____

4 Simplify $\frac{x^2 + 3x + 2}{x + 1}$. [2 marks]

Answer _____

5 Write $\frac{x}{3} + \frac{x}{4}$ as a single fraction. [2 marks]

Answer _____

Level 2 · Build 15 marks
Factorising quadratics to simplify, and adding, subtracting and multiplying.

6 Simplify fully $\frac{x^2 - 9}{x^2 + x - 6}$. [3 marks]

Answer _____

7 Write $\frac{2}{x} + \frac{3}{x + 1}$ as a single fraction. [3 marks]

Answer _____

8 Simplify fully $\frac{2x^2 + 7x + 3}{4x^2 - 1}$. [3 marks]

Answer _____

9 Simplify fully $\frac{x + 2}{x - 1} \times \frac{x^2 - 1}{x^2 + 2x}$. [3 marks]

Answer _____

10 Write $\frac{x + 1}{2} - \frac{x - 3}{5}$ as a single fraction in its simplest form. [3 marks]

Answer _____

Level 3 · Exam-style 17 marks
Hence, show that, dividing and solving equations, in real GCSE style.

11 Solve $\frac{x + 2}{2} + \frac{x - 1}{3} = 4$. [3 marks]

Answer _____

12 (a) Factorise $2x^2 - 5x - 3$. [2 marks]

Answer _____

(b) Hence simplify fully $\dfrac{2x^2 - 5x - 3}{x^2 - 9}$. [2 marks]

Answer _____

13 Solve $\dfrac{3}{x-1} - \dfrac{2}{x+1} = 1$. [4 marks]

Answer _____

14 Simplify fully $\dfrac{x^2 - 4}{3x} \div \dfrac{x+2}{6x^2}$. [3 marks]

Answer _____

15 Show that $\frac{1}{x+1}+\frac{2}{x+3}$ can be written as $\frac{3x+5}{(x+1)(x+3)}$. [3 marks]

Answer _____

Level 4 · Challenge 21 marks
Grade 8–9: combined operations, unknown coefficients and equations that lead to quadratics.

16 Simplify fully $\frac{x^2+2x-15}{2x^2-7x+3} \div \frac{x+5}{4x-2}$. [4 marks]

Answer _____

17 Solve $\frac{x}{x+2}+\frac{4}{x-1}=1$. [4 marks]

Answer _____

18 Write $\frac{x+1}{x-2} - \frac{x-3}{x+2}$ as a single fraction in its simplest form. [4 marks]

Answer _____

19 $\frac{x^2+ax-12}{x^2-9}$ simplifies to $\frac{x+4}{x+3}$. Find the value of a. [3 marks]

Answer _____

20 (a) Show that the equation $\frac{5}{x-1} + \frac{2}{x+3} = 1$ can be written as $x^2 - 5x - 16 = 0$. [3 marks]

Answer _____

(b) Hence solve $\frac{5}{x-1} + \frac{2}{x+3} = 1$. Give your answers correct to 2 decimal places. [3 marks]

Answer _____