Algebraic Fractions questions and answers

11 questions · Extended · 11 non-calculator · worked answers

Name _____ Date _____ Score _____

- Original questions in the style of the Cambridge 0580 papers, each labelled Core or Extended and calculator or non-calculator. Try every question before you look at the answers.
- Worked answers start after the questions. Questions with marks come from our 0580 practice bank (M method, A accuracy, B independent marks).
- Online, with more practice: igcsemathrevision.com/igcse-frontend/0580/algebraic-fractions-questions

Extended: for Papers 2 and 4

1. **Extended · non-calculator · easy**

Simplify $\frac{6x^2}{9x}$.

2. **Extended · non-calculator · easy**

Write $\frac{x}{3} + \frac{x}{4}$ as a single fraction.

3. **Extended · non-calculator · easy · 2 marks**

Write $\frac{x}{4} - \frac{x}{6}$ as a single fraction.

4. **Extended · non-calculator · medium**

Simplify $\frac{x^2-9}{x^2+3x}$.

5. **Extended · non-calculator · medium**

Simplify $\frac{x^2+5x+6}{x^2-4}$.

6. **Extended · non-calculator · medium**

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

7. **Extended · non-calculator · medium**

Write $\frac{3x}{x-4} - 2$ as a single fraction.

8. Extended · non-calculator · medium · 3 marks

Simplify $\dfrac{x^2 - 16}{x^2 + 7x + 12}$.

9. Extended · non-calculator · hard

Simplify $\frac{x^2-x}{4x+8} \times \frac{x+2}{x^2-1}$.

10. Extended · non-calculator · hard

Solve $\frac{6}{x} - \frac{6}{x+1} = 1$.

11. Extended · non-calculator · hard · 3 marks

Simplify $\dfrac{x^2 + 3x}{x - 5} \div \dfrac{x^2 - 9}{2x - 10}$.

Answers and worked solutions

Question 1

Answer: $\frac{2x}{3}$

1. Divide top and bottom by $3x$.

Question 2

Answer: $\frac{7x}{12}$

1. Common denominator 12: $\frac{4x}{12} + \frac{3x}{12}$.

Question 3

2 marks

Answer: $\frac{x}{12}$

M1 $\frac{3x}{12} - \frac{2x}{12}$

A1 $\frac{x}{12}$

Question 4

Answer: $\frac{x-3}{x}$

1. Top: $(x+3)(x-3)$. Bottom: $x(x+3)$.
2. Cancel the common factor $(x+3)$.

Question 5

Answer: $\frac{x+3}{x-2}$

1. Top: $(x+2)(x+3)$. Bottom: $(x+2)(x-2)$.
2. Cancel $(x+2)$.

Question 6

Answer: $\frac{5x-1}{(x+1)(x-2)}$

1. Common denominator $(x+1)(x-2)$.
2. Top: $2(x-2)+3(x+1) = 2x-4+3x+3 = 5x-1$.

Question 7

Answer: $\frac{x+8}{x-4}$

1. $2 = \frac{2(x-4)}{x-4}$
2. $\frac{3x-2x+8}{x-4} = \frac{x+8}{x-4}$

Question 8

3 marks

Answer: $\frac{x-4}{x+3}$

B1 $(x-4)(x+4)$

B1 $(x+3)(x+4)$

A1 $\frac{x-4}{x+3}$

Question 9

Answer: $\frac{x}{4(x+1)}$

1. Factorise: $\frac{x(x-1)}{4(x+2)} \times \frac{x+2}{(x-1)(x+1)}$.
2. Cancel $(x-1)$ and $(x+2)$.

Question 10

Answer: $x = 2$ or $x = -3$

1. Multiply every term by $x(x+1)$: $6(x+1) - 6x = x(x+1)$.
2. $6 = x^2 + x$, so $x^2 + x - 6 = 0$.
3. $(x+3)(x-2) = 0$

Question 11

3 marks

Answer: $\frac{2x}{x-3}$

M1 inverts the second fraction and multiplies

M1 $x(x+3)$, $(x-3)(x+3)$ and $2(x-5)$ seen

A1 $\frac{2x}{x-3}$

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