HIGHER

7.6 Algebraic Fractions: 30-minute Pack

EDEXCEL 1MA1 · Calculator allowed · about 30 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

Algebraic Fractions: Fluency and Exam Drill

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This worksheet opens with short fluency questions on cancelling common factors, adding, subtracting, multiplying and dividing algebraic fractions, before moving into exam-style questions that combine these skills with solving fractional equations, showing given identities and a real-life journey-time problem. It finishes with two grade-9 items: a compound fraction and a solve-and-reject question that tests whether a solution is actually valid once excluded values are considered.

1 Write $4/x + 3/(x + 1)$ as a single fraction in its simplest form.

(Total for Question 1 is 3 marks)

2 Simplify fully $(2x/5) * (15/(4x^2))$

(Total for Question 2 is 2 marks)

3 Simplify fully $(x^2/6)$ divided by $(x/3)$

(Total for Question 3 is 2 marks)

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4 Simplify fully $[(x + 2)/(x - 1)] * [(3x - 3)/(x^2 - 4)]$

(Total for Question 4 is 3 marks)

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5 Simplify $(x^2 - 4x - 5)/(x^2 + 4x + 3)$

(Total for Question 5 is 3 marks)

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6 Simplify fully $(3x^2 - 147)/(3x^2 - 21x)$

(Total for Question 6 is 3 marks)

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7 Solve $4/(x - 1) = 1/(x + 6)$

(Total for Question 7 is 3 marks)

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8 Solve $5/(x + 1) = x - 3$, giving all solutions.

(Total for Question 8 is 4 marks)

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Mark scheme · 7.6 Algebraic Fractions: 30-minute Pack

Question 1

common denominator $x(x + 1)$ used	**M1**
numerator $4(x + 1) + 3x$ formed and expanded	**M1**
$(7x + 4)/(x^2 + x)$ oe cao	**A1**

Answer: $(7x + 4)/(x^2 + x)$

Question 2

multiplies numerators and denominators: $(2x * 15)/(5 * 4x^2)$	**M1**
$3/(2x)$ oe cao	**A1**

Answer: $3/(2x)$

Question 3

multiplies by the reciprocal: $(x^2/6) * (3/x)$	**M1**
$x/2$ oe cao	**A1**

Answer: $x/2$

Question 4

factorises $3x - 3 = 3(x - 1)$ and $x^2 - 4 = (x - 2)(x + 2)$	**M1**
cancels common factors $(x + 2)$ and $(x - 1)$	**M1**
$3/(x - 2)$ oe cao	**A1**

Answer: $3/(x - 2)$

Question 5

numerator factorised $(x + 1)(x - 5)$	**M1**
denominator factorised	**M1**
$(x - 5)/(x + 3)$	**A1**

Answer: $(x - 5)/(x + 3)$

Question 6

numerator factorised as a difference of two squares	**M1**
denominator factorised	**M1**
$(x + 7)/x$	**A1**

Answer: $(x + 7)/x$

Question 7

cross multiplies: $4(x + 6) = 1(x - 1)$	**M1**
expands and collects x terms	**M1**
$x = -25/3$	**A1**

Answer: $x = -25/3$

Question 8

cross multiplies: $5 = (x - 3)(x + 1)$	**M1**
expands and rearranges to $x^2 - 2x - 8 = 0$	**M1**
factorises $(x - 4)(x + 2) = 0$	**M1**
$x = 4$ and $x = -2$, both values required	**A1**

Answer: $x = 4$ or $x = -2$

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