Algebraic Fractions

Question Paper

Course	Edexcel IGCSE Maths
Section	2. Equations, Formulae & Identities
Topic	Algebraic Fractions
Difficulty	Very Hard

Time allowed: 80

Score: /63

Percentage: /100

Question 1

$2 - \dfrac{x+2}{x-3} - \dfrac{x-6}{x+3}$ can be written as a single fraction in the form $\dfrac{ax+b}{x^2-9}$

where a and b are integers.

Work out the value of a and the value of b.

[4 marks]

Question 2

Show that $\dfrac{1}{6x^2+7x-5} \div \dfrac{1}{4x^2-1}$ simplifies to $\dfrac{ax+b}{cx+d}$ where a, b, c and d are integers.

[3 marks]

Question 3a

Simplify fully $\quad \dfrac{3-x}{3x^2-5x-12}$

[2 marks]

Question 3b

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

[3 marks]

Question 4

Write

$$4 - \left[(x+3) \div \frac{x^2 + 5x + 6}{x-2} \right]$$

as a single fraction in its simplest form.
You must show your working.

[4 marks]

Question 5

Show that $\dfrac{3x+6}{x^2 - 3x - 10} \div \dfrac{x+5}{x^3 - 25x}$ simplifies to ax where a is an integer.

[4 marks]

Question 6

Show that $6 + \left[(x+5) \div \dfrac{x^2 + 3x - 10}{x - 1} \right]$ simplifies to $\dfrac{ax - b}{cx - d}$ where a, b, c and d are integers.

[4 marks]

Question 7

Write $\dfrac{25x^2 - 64}{5x^2 - 13x - 6} \times \dfrac{x^2 - 8x + 15}{5x + 8} - (x - 7)$

as a single fraction in its simplest form.
Show clear algebraic working.

[4 marks]

Question 8

Given that $x = \dfrac{5}{9y + 5}$ and that $y = \dfrac{5}{5a - 2}$

find an expression for x in terms of a.
Give your expression as a single fraction in its simplest form.

[4 marks]

Question 9

Express $\dfrac{1}{9x^2 - 25} - \dfrac{1}{6x + 10}$ as a single fraction in its simplest form.

[3 marks]

Question 10

Simplify $\dfrac{2^n - 1}{4^n - 1}$

[2 marks]

Question 11

The flight of a plane was in two stages.

The table shows information about the flight.

	Distance (miles)	Speed (mph)	Time (hours)
1st stage	731	x	$\dfrac{731}{x}$
2nd stage	287	$x - 24$	$\dfrac{287}{x - 24}$

In total, the flight lasted 2 hours.
Work out the value of x.

[5 marks]

Question 12

Solve $\dfrac{5}{4x+1} = \dfrac{2x}{x^2+3}$

Give your solutions to 3 significant figures.
You **must** show your working.

[5 marks]

Question 13

Solve $\dfrac{x}{x+4} + \dfrac{7}{x-2} = 1$

You **must** show your working.

$x = \dots\dots\dots\dots\dots$

[4 marks]

Question 14

Solve $\dfrac{x}{4} - \dfrac{2x}{x+2} = 1$

Give your solutions to 2 decimal places.
You **must** show your working.

[6 marks]

Question 15

Solve this equation, giving your answers correct to 1 decimal place.

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

x = ... or x = ...

[6 marks]