

## 1MA1 Higher themed papers: Algebraic Fractions

Write your name here			
Surname	Other names		
Centre Number		Candidate Number	
Pearson Edexcel Level 1/Level 2 GCSE (9–1)			
<b>Mathematics</b>			
<b>Algebraic Fractions</b>			
			Paper Reference <b>1MA1</b>
<b>You must have:</b> Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.			Total Marks

### Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- You must **show all your working**.
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- If your calculator does not have a  $\pi$  button, take the value of  $\pi$  to be 3.142 unless the question instructs otherwise.

### Information

- The total mark for this paper is **49**. There are **14** questions.
- Questions have been arranged in an ascending order of mean difficulty, as found by all students in the June 2017–November 2019 examinations.
- The marks for **each** question are shown in brackets – *use this as a guide as to how much time to spend on each question.*

### Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

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**1** Simplify  $\frac{x^2 - 16}{2x^2 - 5x - 12}$

.....  
**(3)**

**(Total for Question 1 is 6 marks)**

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**2** Simplify fully  $\frac{3x^2 - 8x - 3}{2x^2 - 6x}$

.....  
**(Total for Question 2 is 3 marks)**

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**3**

Simplify fully

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

.....  
(3)

**(Total for Question 3 is 3 marks)**

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4 Show that  $\frac{2x^2 - 3x - 5}{x^2 + 6x + 5}$  can be written in the form  $\frac{ax + b}{cx + d}$  where  $a, b, c$  and  $d$  are integers.

(Total for Question 15 is 3 marks)

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**5** Solve  $\frac{3x-2}{4} - \frac{2x+5}{3} = \frac{1-x}{6}$

$x = \dots\dots\dots$

**(Total for Question 5 is 4 marks)**

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

**(Total for Question 6 is 4 marks)**

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**7**

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

.....  
(2)

**(Total for Question 7 is 2 marks)**

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- 8**  $2 - \frac{x+2}{x-3} - \frac{x-6}{x+3}$  can be written as a single fraction in the form  $\frac{ax+b}{x^2-9}$   
where  $a$  and  $b$  are integers.

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

$a = \dots\dots\dots$

$b = \dots\dots\dots$

**(Total for Question 8 is 4 marks)**



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- 9** Write  $\frac{3(x-1)}{x^2-4x-5} - \frac{2}{x-5}$  as a single fraction in its simplest form.

.....  
**(Total for Question 9 is 4 marks)**

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**10** (a) Write  $\frac{4x^2 - 9}{6x + 9} - \frac{2x}{x^2 - 3x}$  in the form  $\frac{ax + b}{cx + d}$  where  $a, b, c$  and  $d$  are integers.

.....  
(3)

(b) Express  $\frac{3}{x + 1} + \frac{1}{x - 2} - \frac{4}{x}$  as a single fraction in its simplest form.

.....  
(3)

**(Total for Question 10 is 6 marks)**

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- 11** Show that  $\frac{1}{2x^2 + x - 15} \div \frac{1}{3x^2 + 9x}$  simplifies to  $\frac{ax}{bx + c}$  where  $a$ ,  $b$  and  $c$  are integers.

**(3)**

**(Total for Question 11 is 5 marks)**

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

**(Total for Question 12 is 4 marks)**

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- 13** Show that  $\frac{a}{b+1} - \frac{a}{(b+1)^2}$  can be written as  $\frac{ab}{(b+1)^2}$

**(Total for Question 13 is 2 marks)**

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**14** 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.

.....  
**(Total for Question 14 is 4 marks)**

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**TOTAL MARKS FOR PAPER: 49**