

1MA1 Higher themed papers: Expand and Factorise

Write your name here			
Surname	Other names		
Centre Number		Candidate Number	
Pearson Edexcel Level 1/Level 2 GCSE (9–1)			
Mathematics Expand and Factorise			
		Paper Reference 1MA1	
You must have: 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 π button, take the value of π to be 3.142 unless the question instructs otherwise.

Information

- The total mark for this paper is **58**. There are **20** 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.

1MA1 Higher themed papers: Expand and Factorise

- 1 Expand and simplify $5(p + 3) - 2(1 - 2p)$

.....
(Total for Question 1 is 2 marks)

- 2 (a) Expand and simplify $(x + 5)(x - 9)$

.....
(2)

- (b) Factorise fully $9x^2 + 6x$

.....
(2)
(Total for Question 2 is 4 marks)

- 3 Factorise $x^2 + 3x - 4$

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

1MA1 Higher themed papers: Expand and Factorise



- 4** Factorise $x^2 - 2x - 35$

.....

(Total for Question 4 is 2 marks)

- 5** Show that $(2x + 1)(x + 3)(3x + 7)$ can be written in the form $ax^3 + bx^2 + cx + d$, where a , b , c and d are integers.

(Total for Question 5 is 3 marks)

1MA1 Higher themed papers: Expand and Factorise



6

Show that $(x + 1)(x + 2)(x + 3)$ can be written in the form $ax^3 + bx^2 + cx + d$ where a , b , c and d are positive integers.

(Total for Question 6 is 3 marks)



7

$\sqrt{5}(\sqrt{8} + \sqrt{18})$ can be written in the form $a\sqrt{10}$ where a is an integer.

Find the value of a .

$a = \dots\dots\dots$

(Total for Question 7 is 3 marks)

1MA1 Higher themed papers: Expand and Factorise

8 Expand and simplify $(3x + 2)(2x + 1)(x - 5)$

.....
(Total for Question 8 is 3 marks)

9 Expand and simplify $(x + 2)(x + 8)(x - 4)$

.....
(Total for Question 9 is 3 marks)

1MA1 Higher themed papers: Expand and Factorise

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

.....

(Total for Question 10 is 3 marks)

1MA1 Higher themed papers: Expand and Factorise



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

.....
(Total for Question 11 is 3 marks)



12 (a) Factorise $a^2 - b^2$

.....
(1)

(b) Hence, or otherwise, simplify fully $(x^2 + 4)^2 - (x^2 - 2)^2$

.....
(3)
(Total for Question 12 is 4 marks)

1MA1 Higher themed papers: Expand and Factorise

- 13** (a) Expand and simplify $(x - 2)(2x + 3)(x + 1)$

.....
(3)

$$\frac{y^4 \times y^n}{y^2} = y^{-3}$$

- (b) Find the value of n .

.....
(2)

- (c) Solve $5x^2 - 4x - 3 = 0$
Give your solutions correct to 3 significant figures.

.....
(3)

(Total for Question 13 is 8 marks)

1MA1 Higher themed papers: Expand and Factorise



- 14** Factorise $(x + y)^2 + 3(x + y)$

.....
(1)

(Total for Question 14 is 3 marks)

- 15** Show that

$$(3x - 1)(x + 5)(4x - 3) = 12x^3 + 47x^2 - 62x + 15$$

for all values of x .

(Total of Question 15 is 3 marks)

1MA1 Higher themed papers: Expand and Factorise



16 Martin expands $(2x + 1)(2x - 3)(3x + 2)$

He gets $12x^3 - 4x^2 - 17x + 6$

(b) Explain why Martin's solution cannot be correct.

.....

.....

(1)

(Total for Question 16 is 2 marks)

17 Expand and simplify $(x + 2)(2x - 3)(3x + 1)$

.....

(3)

(Total for Question 17 is 4 marks)



18 Factorise $3(x - y)^2 - 2(x - y)$

.....

(2)

(Total for Question 18 is 2 marks)

1MA1 Higher themed papers: Expand and Factorise



19

(a) Simplify $\frac{x - 1}{5(x - 1)^2}$

.....
(1)

(b) Factorise fully $50 - 2y^2$

.....
(2)

(Total for Question 19 is 3 marks)

1MA1 Higher themed papers: Expand and Factorise

- 20 Maryam is trying to expand and simplify $(n - 2)^2$
Here is her working.

$$\begin{aligned}(n - 2)^2 &= (n - 2)(n - 2) \\ &= n^2 - 2n - 2n - 4 \\ &= n^2 - 4n - 4\end{aligned}$$

Maryam's answer is wrong.

- (a) Find Maryam's mistake.

.....
.....
(1)

Josh is trying to factorise $x^2 - 6x + 8$
His reasoning is,

because $4 \times 2 = 8$

and $4 + 2 = 6$

then $x^2 - 6x + 8 = (x + 4)(x + 2)$

- (b) Explain what is wrong with Josh's reasoning.

.....
.....
.....
(1)
(Total for Question 20 is 4 marks)

TOTAL MARKS FOR PAPER: 58