

Name

ANSWERS

Class

## MATHS TEACHER HUB

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# Factorise

(9 – 1) Topic booklet

# Higher

These questions have been collated from previous years GCSE Mathematics papers.

**You must have:** Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser.

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.*
- Diagrams are NOT accurately drawn, unless otherwise indicated.
- You must **show all your working out**.
- If the question is a 1H question you are not allowed to use a calculator.
- If the question is a 2H or a 3H question, you may use a calculator to help you answer.

### Information

- 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.

**Answer ALL questions**  
**Write your answers in the space provided.**  
**You must write down all the stages in your working.**

1 Factorise fully  $15x^3 + 3x^2y$



$$3x^2(5x + y)$$

(2)

June 2022 – Paper 2H

(Total for Question 1 is 2 marks)

1 Factorise fully  $9x^2 + 6x$



$$3x(3x + 2)$$

(2)

November 2019 – Paper 3H

(Total for Question 1 is 2 marks)

1 Factorise fully  $6x^2 + 15x$



$$3x(2x + 5)$$

(2)

November 2023 – Paper 2H

(Total for Question 1 is 2 marks)

1 Factorise  $y^2 + 27y$

$$y(y+27)$$

(1)

Specimen 2 – Paper 1H

(Total for Question 1 is 1 mark)

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



$$(x+4)(x-1)$$

Specimen 1 – Paper 3H

(Total for Question 6 is 2 marks)

9 Factorise  $y^2 + 7y + 6$



$$(y+6)(y+1)$$

(2)

Sample 1 – Paper 3H

(Total for Question 9 is 2 marks)

10 Factorise fully  $50 - 2y^2$

$$2(25 - y^2)$$

$$2(5+y)(5-y)$$

(2)

November 2018 – Paper 1H

(Total for Question 10 is 2 marks)

13 Factorise  $(x + y)^2 + 3(x + y)$

$$(x+y)(x+y+3)$$

$$(x+y)(x+y+3)$$

(1)

November 2019 – Paper 1H

(Total for Question 13 is 1 mark)

14 Factorise fully  $4p^2 - 36$

$$4(p^2 - 9)$$

$$4(p+3)(p-3)$$

(2)

June 2022 – Paper 3H

(Total for Question 14 is 2 marks)

15 Factorise  $3k^2 + 11k - 4$

$$(3k-1)(k+4)$$

(2)

June 2024 – Paper 3H

(Total for Question 15 is 2 marks)

15 Factorise  $a^2 - b^2$

$$(a+b)(a-b)$$

(1)

June 2018 – Paper 1H

(Total for Question 15 is 1 mark)

15 Factorise  $a^2 - b^2$



$$(a+b)(a-b)$$

(1)

June 2023 – Paper 3H

(Total for Question 15 is 1 mark)

16 Factorise fully  $20x^2 - 5$

$$5(4x^2 - 1)$$

$$5(2x+1)(2x-1)$$

Sample 1 – Paper 1H

(Total for Question 16 is 2 marks)

17 (a) Factorise  $6x^2 - 5x - 4$

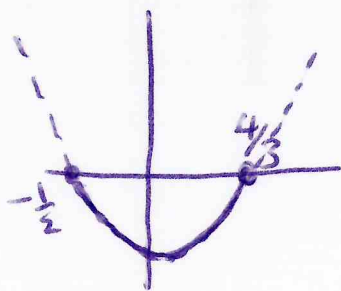
$$(3x - 4)(2x + 1)$$

(2)

(b) Hence, or otherwise, solve  $6x^2 - 5x - 4 < 0$

$$(3x - 4)(2x + 1) < 0$$

$$x = \frac{4}{3} \quad x = -\frac{1}{2}$$



$$-\frac{1}{2} < x < \frac{4}{3}$$

(2)

November 2023 – Paper 1H

(Total for Question 17 is 4 marks)