



JP Maths

Revision



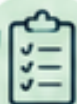
Attempt the paper
before watching the
solutions!

[https://www.youtube.com/
@JPMathsRevision](https://www.youtube.com/@JPMathsRevision)



HIGHER TIER

Algebraic Fractions



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 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.



You've got this! ❤️

1. Simplify fully $\frac{2x + 6}{x^2 + 8x + 15}$

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

2. Simplify fully $\frac{x + 3}{x^2 - 9}$

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

3. Simplify fully $\frac{2x - 10}{x^2 - 2x - 15}$

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

4. Simplify fully $\frac{x^2 + 5x + 6}{x^2 + 7x + 10}$

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

5. Simplify fully $\frac{x^2 - 16}{x^2 - 5x + 4}$

.....
(Total for Question 5 is 3 marks)

6. Simplify fully $\frac{x^2 - 7x + 12}{x^2 - 8x + 12}$

.....
(Total for Question 6 is 3 marks)

7. Simplify fully $\frac{4x + 2}{2x^2 + 7x + 3}$

.....
(Total for Question 7 is 3 marks)

8. Simplify fully $\frac{2x^2 - 5x - 3}{2x^2 + x - 3}$

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

9. Simplify fully $\frac{3x^2 + 8x + 5}{6x^2 + 11x - 10}$

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

10. Show that $\frac{2}{x-1} + \frac{3}{x+1}$ can be written in the form $\frac{ax+b}{x^2-1}$ where a and b are integers.

.....
(Total for Question 10 is 3 marks)

11. Show that $\frac{4}{x} + \frac{3}{x+2}$ can be written in the form $\frac{ax+b}{x^2+2x}$ where a and b are integers.

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

- 12.** Show that $\frac{2}{x-1} - \frac{5}{x+1}$ can be written in the form $\frac{ax+b}{x^2-1}$ where a and b are integers.

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

- 13.** Show that $\frac{3}{x-2} - \frac{4}{x^2-4}$ can be written in the form $\frac{ax+b}{(x+2)(x-2)}$ where a and b are integers.

.....
(Total for Question 13 is 3 marks)

- 14.** Show that $\frac{4}{x^2 - 5x + 6} + \frac{1}{x - 2}$ can be written in the form $\frac{ax + b}{(x - 3)(x - 2)}$ where a and b are integers.

.....
(Total for Question 14 is 3 marks)

- 15.** Show that $\frac{x + 1}{x - 2} + \frac{2x - 5}{x + 2} + 1$ can be written in the form $\frac{ax^2 + bx + c}{x^2 - 4}$ where a , b and c are integers.

.....
(Total for Question 15 is 3 marks)

16. Write $\frac{x^2 - 9}{x} \times \frac{x}{x + 3}$ as a single fraction in its simplest form.

.....
(Total for Question 16 is 3 marks)

17. Write $\frac{x^2 + 2x - 15}{x - 3} \times \frac{3}{x + 5}$ as a single fraction in its simplest form.

.....
(Total for Question 17 is 3 marks)

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

.....
(Total for Question 18 is 3 marks)

19. Write $\frac{x^2 + 5x + 6}{x + 3} \div \frac{x + 2}{4}$ as a single fraction in its simplest form.

.....
(Total for Question 19 is 3 marks)

20. Write $\frac{3x^2 - 27}{6x} \div \frac{x - 3}{2}$ as a single fraction in its simplest form.

.....
(Total for Question 20 is 3 marks)

21. Write $\frac{6x^2 - 7x - 3}{3x^2 + 8x + 5} \div \frac{2x - 1}{3x + 5}$ as a single fraction in its simplest form.

.....
(Total for Question 21 is 3 marks)

22. Show that $\frac{8}{x-2} + \left(\frac{x+1}{2} \div \frac{x^2-4}{3x} \right)$ can be written in the form $\frac{ax+b}{cx+d}$

.....
(Total for Question 22 is 4 marks)
