

A-Level Mathematics: 9709 Mathematics November 2025 Question Paper 11

- 2

(a)

[3]

[illegible]

- (b)

[2]

1

3

$$(px+3)^5 - \left(x^3 + \frac{p}{x}\right)^4,$$

the coefficient of x^4 is 216.

Find the value of the positive constant p .

[5]

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

- 9** An arithmetic progression has first term 2 and common difference d . The sum of the first n terms is denoted by S_n .
- (a)** It is given that $(S_2 - 1)$, S_4 , S_9 are the first three terms of a second arithmetic progression.

Find the value of d .

[4]

[illegible]

(b) Hence find the difference between the values of the 15th terms of the two arithmetic progressions. [4]

[illegible]

Find the term independent of x in the expansion of $\left(2x^2 - \frac{2}{x}\right)^{15}$.

[3]

This image shows a full page of a handwriting practice worksheet. It features approximately 20 horizontal dotted lines spaced evenly down the page. The lines are designed to help children learn letter height and placement. There is no text or other markings on the page.

8 The first three terms of a geometric progression are a , b and c respectively, where a , b and c are positive constants. The first three terms of an arithmetic progression are a , b and $-3c$ respectively.

(a) Show that $a^2 - 10ac + 9c^2 = 0$. [3]

It is now given that $a = 9$ and c takes the smaller of its two possible values.

(b) (i) Find the sum to infinity of the geometric progression. [5]

This image shows a full page of a handwriting practice worksheet. It consists of multiple sets of three horizontal dashed lines spaced evenly down the page, providing a guide for letter height and placement. The background is plain white, and there are no other markings or text present.

- [3]

This image shows a full page of handwriting practice paper. It features multiple sets of three horizontal dashed lines, each set consisting of a top line, a middle line, and a bottom line. These lines are evenly spaced across the entire page to guide letter height and placement. The background is plain white, and there are no margins or additional markings.

- 3

- (a)

This image shows a full page of a handwriting practice worksheet. It consists of multiple sets of three horizontal dashed lines spaced evenly down the page, providing a guide for letter height and placement. The background is plain white, and there are no other markings or text present.

- (b)

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- 5

(i) $(2 - px)^5$

(ii) $\left(1 - \frac{1}{2}x\right)^4$

[illegible]

- (b)** Given that the coefficient of x^2 in the expansion of $(2 - px)^5 \left(1 - \frac{1}{2}x\right)^4$ is 93, find the possible values of the constant p . [3]

[illegible]

A-Level Mathematics: 9709 Mathematics June 2025 Question Paper 12

- 3** The coefficient of x' in the expansion of $\left(px^{\frac{1}{2}} + \frac{1}{p}x\right)$ is 1280.

[4]

[illegible]

- 10 (a)** The first, second and third terms of an arithmetic progression are $4k$, k^2 and $8k$ respectively, where k is a non-zero constant.

- (i) Find the value of k . [2]

[illegible]

- (ii) Find the sum of the first 20 terms of the progression. [3]

This image shows a full page of white paper with horizontal dashed lines, typical of primary school handwriting practice paper. The lines are evenly spaced and run across the width of the page. There is no text or other markings on the page.

- (b) The fourth and sixth terms of a geometric progression are 36 and 6 respectively. The common ratio of the progression is positive.

Find the sum to infinity of the progression. Give your answer in the form $\frac{a}{\sqrt{b}-c}$, where a , b and c are integers. [5]

[5]

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