



Quiz 5

Grade	AS
Subject	Pure Mathematics
Paper Name	Paper 3
Duration	60 minutes

Student's Information

Name (Pinyin)	English Name	Class	Group

Instructions

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Do **not** use an erasable pen or correction fluid.
- Write your answer to each question in the space provided.
- If additional space is needed, you should use the lined page at the end of this booklet; the question number or numbers must be clearly shown.
- You should use a calculator where appropriate.
- You must show all necessary working clearly; no marks will be given for unsupported answers from a calculator.
- Give non-exact numerical answers correct to 3 significant figures, or 1 decimal place for angles in degrees, unless a different level of accuracy is specified in the question.
- **You are reminded of the need for clear representation in your answers.**

Information:

- The total mark for this paper is 60.
- The number of marks for each question or part question is shown in brackets [].

By the proposed method or hints (if any), or otherwise, evaluate each of the following integrals, giving all your answers in exact forms wherever appropriate.

1. $\int \frac{\ln x}{x} dx$ [3]

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2. $\int \frac{1}{x^3 - x} dx$; by first decomposing into partial fractions [5]

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3. $\int_2^3 \frac{x}{x^2+1} dx;$ by substitution [5]

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4. $\int_2^3 \frac{x}{x^2-1} dx$ [5]

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5. $\int_0^4 x\sqrt{2x+1} dx$

[5]

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6. $\int \frac{x}{x^2+x+1} dx;$

[5]

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7. $\int_0^{\pi^2} \sin \sqrt{x} dx$; by using a suitable substitution, followed by integration by parts [6]

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8. $\int_1^2 \frac{e^{\frac{1}{x}}}{x^3} dx$ [6]

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9. $\int e^{-x} \sin 2x \, dx;$ by applying integration by parts twice [6]

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10. $\int_0^{\frac{\pi}{4}} \sin x \cos 2x \, dx$ [6]

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11. $\int_{-\frac{1}{2}}^{\frac{1}{2}} \frac{x^3 + x^2 - x + 1}{x^4 - 1} dx;$ by first decomposing into partial fractions

[8]

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