



Advanced Higher Maths 2026 Paper 1 Practice Paper PRO PASS MASTERCLASS

Advanced
Higher Maths



TOPIC: Clelland Maths 2026 - Advanced Higher Maths Paper 1 Practice Paper

Paper 1 (Non-Calculator)

Duration — 1 hour

Total marks — 35

Attempt ALL questions.
You must NOT use a calculator.

To earn full marks you must show your working in your answers.
State the units for your answer where appropriate.
Write your answers clearly in the spaces provided.

1. Given $f(x) = \frac{\ln(4x)}{x^3}$ for $x > 0$, find $f'(x)$. **3**

2. A complex number is defined by $z = -1 + \sqrt{3}i$. **2**
(a) Express z in polar form.

(b) Use de Moivre's theorem to evaluate z^4 , expressing your answer in the form $a + ib$. **2**

3. Points $A(1, 2, -1)$, $B(4, 3, 2)$, and $C(2, -1, 4)$ lie in 3-dimensional space. Find the Cartesian equation of the plane Π which passes through the points A , B , and C . **4**



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4. Use the substitution $u = 1 + \cos x$ to evaluate exactly:

$$\int_0^{\pi/2} \frac{\sin x}{(1 + \cos x)^3} dx$$

4

5. (a) Express $\frac{3x-1}{(x+1)(x-3)}$ in partial fractions.

3

(b) Hence evaluate exactly $\int_4^5 \frac{3x-1}{(x+1)(x-3)} dx$, expressing your answer in the form $\ln\left(\frac{a}{b}\right)$.

3



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6. A system of linear equations is given by:

$$x + y + z = 2$$

$$2x - y + 3z = 5$$

$$3x + y + kz = 9$$

5

Use Gaussian elimination to determine the value of k for which this system has no solution.



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7. Prove by contradiction that if x is an irrational number, then $2x + 1$ is also an irrational number. **4**

8. A curve is defined implicitly by the equation $x^2y^2 + 3y = 4x$. Find the gradient of the tangent to the curve at the point $(1, 1)$. **5**

[END OF QUESTION PAPER 1]



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Final Answers

1. $\frac{1-3\ln(4x)}{x^4}$
2. (a) $2\left(\cos \frac{2\pi}{3} + i \sin \frac{2\pi}{3}\right)$ (b) $-8 + 8\sqrt{3}i$
3. $7x - 6y - 5z = 0$
4. $\frac{3}{8}$
5. (a) $\frac{1}{x+1} + \frac{2}{x-3}$ (b) $\ln\left(\frac{24}{5}\right)$
6. $k = \frac{11}{3}$
7. *Proof completed by contradiction.*
8. $\frac{2}{5}$

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