

INKMATHS FLASHCARDS

Further Maths definitions and slips

9 cards · fronts and backs

Print double-sided, flipping on the long edge, and each answer lands behind its question. Cut along the card borders.

Definitions in precise wording, the standard results the formulae booklet does not print, a check-yourself question per topic, and the slips that lose marks. The same cards run on the website with spaced-repetition scheduling, at inkmaths.co.uk/flashcards.

DEFINITION

Define: Principal argument.

FURTHER MATHS: DEFINITIONS AND SLIPS

DEFINITION

Define: Invariant line.

FURTHER MATHS: DEFINITIONS AND SLIPS

DEFINITION

Define: Improper integral.

FURTHER MATHS: DEFINITIONS AND SLIPS

CHECK YOURSELF

Evaluate $(1 + i)^4$ without expanding four brackets.

FURTHER MATHS: DEFINITIONS AND SLIPS

CHECK YOURSELF

Find the distance from the origin to the plane $2x + 2y + z = 9$.

FURTHER MATHS: DEFINITIONS AND SLIPS

CHECK YOURSELF

Find the mean value of $f(x) = x^3$ on $[0, 2]$.

FURTHER MATHS: DEFINITIONS AND SLIPS

SPOT THE ERROR

Say what is wrong with this claim:

Differentiating cosh introduces a minus sign, just as cos does.

FURTHER MATHS: DEFINITIONS AND SLIPS

SPOT THE ERROR

Say what is wrong with this claim:

Polar area is the integral of $r \, d\theta$, by analogy with area under a graph.

FURTHER MATHS: DEFINITIONS AND SLIPS

DEFINITION

A line whose every point maps to a point of the same line under the transformation. Points may move along it; none leaves it.

FURTHER MATHS: DEFINITIONS AND SLIPS

DEFINITION

The angle a complex number's position vector makes with the positive real axis, measured anticlockwise, in the interval $(-\pi, \pi]$.

FURTHER MATHS: DEFINITIONS AND SLIPS

CHECK YOURSELF

$(1 + i)^2 = 2i$, and $(2i)^2 = -4$. Two squarings beat a binomial expansion; De Moivre gives the same via modulus $(\sqrt{2})^4 = 4$ and argument $4 \times \pi/4 = \pi$.

FURTHER MATHS: DEFINITIONS AND SLIPS

DEFINITION

An integral with an infinite limit or an integrand unbounded at a limit, defined as the limit of an ordinary integral, and said to converge when that limit is finite.

FURTHER MATHS: DEFINITIONS AND SLIPS

CHECK YOURSELF

$\int x^3 dx$ from 0 to 2 is 4; dividing by the width 2 gives mean 2. Integral over width, always.

FURTHER MATHS: DEFINITIONS AND SLIPS

CHECK YOURSELF

$|0 + 0 + 0 - 9|/\sqrt{(4 + 4 + 1)} = 9/3 = 3$: substitute the point, subtract d, divide by the normal's length.

FURTHER MATHS: DEFINITIONS AND SLIPS

SPOT THE ERROR

Polar regions are swept by sectors, not strips, and a sector's area is $\frac{1}{2}r^2 d\theta$. The r comes in squared, with a half in front.

FURTHER MATHS: DEFINITIONS AND SLIPS

SPOT THE ERROR

$\cosh' = \sinh$ and $\sinh' = \cosh$, both signs positive: the minus in sinh's definition supplies internally what trig needs a sign flip for. No minus appears anywhere in the pair.

FURTHER MATHS: DEFINITIONS AND SLIPS

SPOT THE ERROR

Say what is wrong with this claim:

Once the inductive step is proved, the statement holds for all n .

FURTHER MATHS: DEFINITIONS AND SLIPS

SPOT THE ERROR

The step only passes truth along; without a verified base case there is no truth to pass. False formulae can survive the step and die only at $n = 1$, which is why both halves earn marks.

FURTHER MATHS: DEFINITIONS AND SLIPS