

INKMATHS FLASHCARDS

Integration standard results

12 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 inkphysics.co.uk/maths/flashcards.

STANDARD RESULT

Power rule ($n \neq -1$):

$$\int x^n dx = ?$$

INTEGRATION: STANDARD RESULTS

STANDARD RESULT

The $n = -1$ case:

$$\int (1)/(x) dx = ?$$

INTEGRATION: STANDARD RESULTS

STANDARD RESULT

Exponential ($k \neq 0$):

$$\int e^{kx} dx = ?$$

INTEGRATION: STANDARD RESULTS

STANDARD RESULT

Sine (x in radians):

$$\int \sin x dx = ?$$

INTEGRATION: STANDARD RESULTS

STANDARD RESULT

Cosine (x in radians):

$$\int \cos x dx = ?$$

INTEGRATION: STANDARD RESULTS

STANDARD RESULT

Log integral:

$$\int (f'(x))/(f(x)) dx = ?$$

INTEGRATION: STANDARD RESULTS

RECALL

State how to choose u when integrating by parts.

INTEGRATION: STANDARD RESULTS

RECALL

State what to do when part of an area lies below the x -axis.

INTEGRATION: STANDARD RESULTS

STANDARD RESULT

$$\int \frac{1}{x} dx = \ln|x| + c$$

INTEGRATION: STANDARD RESULTS

STANDARD RESULT

$$\int x^n dx = \frac{x^{n+1}}{(n+1)} + c$$

INTEGRATION: STANDARD RESULTS

STANDARD RESULT

$$\int \sin x dx = -\cos x + c$$

INTEGRATION: STANDARD RESULTS

STANDARD RESULT

$$\int e^{kx} dx = \frac{1}{k} e^{kx} + c$$

INTEGRATION: STANDARD RESULTS

STANDARD RESULT

$$\int \frac{f'(x)}{f(x)} dx = \ln|f(x)| + c$$

INTEGRATION: STANDARD RESULTS

STANDARD RESULT

$$\int \cos x dx = \sin x + c$$

INTEGRATION: STANDARD RESULTS

RECALL

Split the integral at the root and take the modulus of each piece before adding. Integrating straight through returns the signed total, so the two parts cancel and the area comes out too small. Sketch first and the roots tell you where to split.

INTEGRATION: STANDARD RESULTS

RECALL

Pick the u that gets simpler when you differentiate it. A power of x beats a trig or exponential factor, and $\ln x$ is always u because there is nothing else you can integrate it as. Choose the other way round and the second integral is worse than the first.

INTEGRATION: STANDARD RESULTS

CHECK YOURSELF

Find the integral of $6e^{3x}$ with respect to x .

INTEGRATION: STANDARD RESULTS

STANDARD RESULT

Area under a parametric curve:

$\int y \, dx = ?$ in terms of t

INTEGRATION: STANDARD RESULTS

RECALL

State how to solve a separable differential equation.

INTEGRATION: STANDARD RESULTS

SPOT THE ERROR

Say what is wrong with this claim:

The integral of $\sin x$ is $\cos x$.

INTEGRATION: STANDARD RESULTS

STANDARD RESULT

$\int y \frac{dx}{dt} dt$, with the limits converted to values of t

INTEGRATION: STANDARD RESULTS

CHECK YOURSELF

$2e^{3x} + c$. Divide by the 3 the chain rule would have produced. An indefinite integral written without the constant loses the last mark, every time.

INTEGRATION: STANDARD RESULTS

SPOT THE ERROR

It is $-\cos x + c$. Check by differentiating your answer: the derivative of $-\cos x$ is $\sin x$, which recovers the integrand. Differentiate-to-check catches every sign slip of this kind.

INTEGRATION: STANDARD RESULTS

RECALL

Get every y with the dy and every x with the dx , then integrate both sides and write one constant. Dividing by a term in y assumes it is not zero, and any y that makes it zero is a constant solution in its own right. Find that constant from the given condition before you rearrange, because rearranging first turns c into something you cannot evaluate.

INTEGRATION: STANDARD RESULTS