Matching Game – Integral I

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Instructions: Select a question clicking its checkbox. Solve the problem and find the answer. No guessing! A maximum of 3 tries on any problem before you get 3 penalty points ! Passing is to complete the puzzle with only 4 incorrect answers.

To the picture: The person on the picture was born on 28 April 1906 in Brno, Czech Republic (former Brünn, Austria-Hungary) and died on 14 Jan 1978 in Princeton, New Jersey, USA. He is best known for his proof of **Incompleteness Theorems**. He proved fundamental results about axiomatic systems, showing in any axiomatic mathematical system there are propositions that cannot be proved or disproved within the axioms of the system. In particular the consistency of the axioms cannot be proved. This ended a hundred years of attempts to establish axioms which would put the whole of mathematics on an axiomatic basis. It also implies that a computer can never be programmed to answer all mathematical questions.

Who is he? – Solve problems on next page.

Questions

1. $\int e^{-x}\,\mathrm{d}x$

2. $\int \frac{1}{\sqrt{x^2-2}}\,\mathrm{d}x$

3. $\int -e^{x}\,\mathrm{d}x$

4. $\int \frac{1}{\sqrt{1-2x^2}}\,\mathrm{d}x$

5. $\int \sqrt{\frac{2}{x^2-1}}\,\mathrm{d}x$

6. $\int -e^{-x}\,\mathrm{d}x$

7. $\int \frac{1}{\sqrt{2-x^2}}\,\mathrm{d}x$

8. $\int \frac{1}{\sqrt{2+x^2}}\,\mathrm{d}x$

9. $\int \frac{1}{\sqrt{2x^2-2}}\,\mathrm{d}x$

Answers

a. $\sqrt{2}\arcsin\sqrt{2}x$

b. $\ln\left|x+\sqrt{\sqrt{2}+x^2}\right|$

c. $-e^{x}$

d. $\frac{1}{\sqrt{2}}\arcsin\sqrt{2}x$

e. $\ln\left|1+\sqrt{x^2+1}\right|$

f. $\ln\left|x+\sqrt{2+x^2}\right|$

g. $\arcsin\sqrt{2}x$

h. $\arcsin\frac{x}{\sqrt{2}}$

i. e^{-x}

j. $\ln\left|1-\sqrt{x^2+1}\right|$

k. $\frac{1}{\sqrt{2}}\ln\left|x+\sqrt{x^2-1}\right|$

l. $\ln\left|x+\sqrt{x^2-2}\right|$

m. $\sqrt{2}\ln\left|x+\sqrt{x^2-1}\right|$

n. $\ln\left|x+\sqrt{x^2-1}\right|$

o. $-e^{-x}$