Integral calculus
Integration by formulas

Robert Mařík

July 23, 2006

Look at three or four or twenty my quizzes and then fill in my questionnaire please!

- Fill in blank fields and press Enter.
- The green boundary indicates correct answer, the red boundary indicates wrong answer.
- If you cannot solve the problem, click ? to see the correct answer. If there are more fields to be filled, click repeatedly.

Quiz

1. Find indefinite integrals. Use formulas and algebraic modifications, if necessary.

(a) $\int e^x \mathrm{d}x =$ [ ] $+C$ [?]

(b) $\int \frac{x^2+x+4}{x} \mathrm{d}x =$ [ ] $+C$ [?]

(c) $\int \sqrt{x}(1-\sqrt{x}) \mathrm{d}x =$ [ ] $+C$ [?]

(d) $\int \frac{1-\cos^2 x}{\cos^2 x} \mathrm{d}x =$ [ ] $+C$ [?]

(e) $\int \frac{1}{3+x^2} \mathrm{d}x =$ [ ] $+C$ [?]

(f) $\int \frac{1}{\sqrt{3+x^2}} \mathrm{d}x =$ [ ] $+C$ [?]

(g) $\int \left(\frac{6}{x^3}+x\right) \mathrm{d}x =$ [ ] $+C$ [?]

(h) $\int \left(\sqrt{x}-\frac{1}{\sqrt{x}}\right) \mathrm{d}x =$ [ ] $+C$ [?]

(i) $\int (x+1)^2 \mathrm{d}x =$ $+C$?

(j) $\int 3 \cdot 2^x \mathrm{d}x =$ $+C$?

(k) $\int \dfrac{\sqrt{x}+1}{x} \mathrm{d}x =$ $+C$?

(l) $\int \left(2x^2 - x + 4\right) \mathrm{d}x =$ $+C$?

(m) $\int \dfrac{(x+1)(x-1)}{x^2} \mathrm{d}x =$ $+C$?

(n) $\int \dfrac{1}{x^2+6} \mathrm{d}x =$ $+C$?

(o) $\int \dfrac{x^2+2}{x^2+1} \mathrm{d}x =$ $+C$?

2. In the following questions use formulas $\int f(ax+b)\mathrm{d}x$ and $\int \frac{f'(x)}{f(x)}\mathrm{d}x$.

(a) $\int e^{2x}\mathrm{d}x =$ $+C$?

(b) $\int \frac{1}{3x+5}\mathrm{d}x =$ $+C$?

(c) $\int \left(1+3e^{-x}\right)\mathrm{d}x =$ $+C$?

(d) $\int \left(e^{x}+1\right)^{2}\mathrm{d}x =$ $+C$?

(e) $\int \frac{1}{2}\left(e^{x}+e^{-x}\right)\mathrm{d}x =$ $+C$?

(f) $\int \left(\frac{1+2e^{x}}{e^{x}}\right)\mathrm{d}x =$ $+C$?

(g) $\int \frac{e^{x}}{1+e^{x}}\mathrm{d}x =$ $+C$?

(h) $\int \frac{e^{-2x}}{1+e^{-2x}}\mathrm{d}x =$ $+C$?

(i) $\int \frac{x}{x^2+6}\mathrm{d}x =$ $+C$?

(j) $\int \frac{x+5}{x^2+4}\mathrm{d}x =$ $+C$?

(k) $\int \frac{\sin x}{\cos x}\mathrm{d}x =$ $+C$?

(l) $\int 2\sin x\cos x\mathrm{d}x =$ $+C$?

(m) $\int \sin\left(x-\frac{\pi}{2}\right)\mathrm{d}x =$ $+C$?

(n) $\int \sin(\pi-x)\mathrm{d}x =$ $+C$?

(o) $\int e^{-x}\mathrm{d}x =$ $+C$?

(p) $\int e^{3x+1}\mathrm{d}x =$ $+C$?

(q) $\int 2e^{x-2}\mathrm{d}x =$ $+C$?

(r) $\int e^{5-3x}\mathrm{d}x =$ $+C$?

(s) $\displaystyle\int \frac{-4}{\cos^2(2x)}\,\mathrm{d}x =$ [ ] $+C$?

3. Write correct numbers inside small colored rectangles and then write the primitive function (white field).

(a) $\int \frac{x^2}{x^3+1}\mathrm{d}x = \int \square \frac{(x^3+1)'}{x^3+1}\mathrm{d}x$

$= \square + C$?

(b) $\int \frac{3x}{x^2+4}\mathrm{d}x = \int \square \frac{(x^2+4)'}{x^2+4}\mathrm{d}x$

$= \square + C$?

(c) $\int \frac{x+2}{x^2+4x+1}\mathrm{d}x = \int \square \frac{(x^2+4x+1)'}{x^2+4x+1}\mathrm{d}x$

$= \square + C$?

(d) $\int \frac{3x-9}{x^2-6x+20}\mathrm{d}x = \int \square \frac{2x-6}{x^2-6x+20}\mathrm{d}x$

$= \square + C$?

(e) $\displaystyle\int \frac{x+5}{x^2+4}\,\mathrm{d}x = \int \left(\square \frac{2x}{x^2+4} + \square \frac{1}{x^2+4} \right) \mathrm{d}x$

$= \square + C$?

(f) $\displaystyle\int \frac{3x-5}{x^2+9}\,\mathrm{d}x = \int \left(\square \frac{2x}{x^2+9} + \square \frac{1}{x^2+9} \right) \mathrm{d}x$

$= \square + C$?

(g) $\displaystyle\int \frac{1}{x^2+2x+5}\,\mathrm{d}x = \int \frac{1}{\left(x+\square\right)^2 + \square}\,\mathrm{d}x$

$= \square + C$?

(h) $\displaystyle\int \frac{1}{x^2-6x+10}\,\mathrm{d}x = \int \frac{1}{\left(x+\square\right)^2 + \square}\,\mathrm{d}x$

$= \square + C$?

(i) $\int \frac{1}{x^2+12x+40}\,\mathrm{d}x = \int \frac{1}{\left(x+\square\right)^2+\square}\,\mathrm{d}x$

$= \square + C$?

(j) $\int \frac{1}{x^2-3x+4}\,\mathrm{d}x = \int \frac{1}{\left(x-\square\right)^2+\square}\,\mathrm{d}x$

$= \square + C$?

(k) $\int \frac{1}{\sqrt{x^2+x+1}}\,\mathrm{d}x = \int \frac{1}{\sqrt{\left(x+\square\right)^2+\square}}$

$= \square + C$?

Home Page
Print
Title Page
◀◀ ▶▶
◀ ▶
Page 9 of 11
Go Back
Full Screen
Close
Quit

(l) $\displaystyle\int \frac{x+1}{x^2+4x+8}\,dx = \int \square\,\frac{2x+4}{x^2+4x+8}\,dx$

$\displaystyle + \int \left(\square\right)\frac{1}{\left(x+\square\right)^2+\square}\,dx$

$= \square + C$?

(m) $\displaystyle\int \frac{x^2-1}{x^2+1}\,dx = \int \square + \frac{\square}{x^2+1}$

$= \square + C$?

(n) $\displaystyle\int \frac{x^2-2x+1}{x^2+2x+1}\,dx = \int \square + \frac{\square\,x+\square}{x^2+2x+1}\,dx$

$\displaystyle = \int \square + \square\,\frac{2x+2}{x^2+2x+1} + \frac{\square}{x^2+2x+1}$

$= \square + C$?

(o) $\int \sin x \cos x \mathrm{d}x = \int \square \sin\left(\square x\right) \mathrm{d}x$

$= \square + C$

?

ROBERT MAŘÍK

Integrals – formulas

file int-form.tex