Test Forkurs Matematikk OsloMet
24. februar 2020

Regn uten bruk av hjelpemiddel

Finn de antideriverte til følgende funksjoner.

$a(x) = x^3$

$$\int x^3 dx = \frac{x^4}{4} + c$$

$b(x) = \dfrac{1}{x^3} = x^{-3}$

$$\int b(x)dx = \int x^{-3} dx$$
$$= \frac{x^{-2}}{-2} + c = \frac{-1}{2x^2} + c$$

$c(x) = x^5 - 3x^2 + 7$

$$\int c(x)dx = \int x^5 dx - 3\int x^2 dx + \int 7 dx = \frac{x^6}{6} - x^3 + 7x + c$$

$d(x) = -4\cos(x) + 3$

$$\int d(x)dx = -4\int \cos x\, dx + \int 3 dx = -4\sin x + 3x + c$$

$e(x) = \dfrac{3}{x} + e^x$

$$\int e(x)dx = 3\int \frac{1}{x}dx + \int e^x dx = 3\ln|x| + e^x + c$$

$f(x) = e^{x+2}/4$

$$= \frac{e^2}{4}\cdot e^x \qquad \int f(x)dx = \frac{e^2}{4}\int e^x dx = \frac{e^2}{4}e^x + c$$
$$= \frac{e^{x+2}}{4} + c$$

$g(x) = \dfrac{4}{\sqrt[3]{x}} = \dfrac{4}{x^{1/3}} = 4x^{-1/3}$

$$\int g(x)dx = 4\int x^{-1/3}dx = 4\cdot\frac{x^{2/3}}{2/3} + c = 6x^{2/3} + c = 6\sqrt[3]{x^2} + c$$

$h(x) = 3\sin(4x+2)$

$$\int h(x)dx = 3\int \sin(4x+2)dx = 3\frac{-\cos(4x+2)}{4} + c$$
$$= -\frac{3}{4}\cos(4x+2) + c$$

$i(x) = \dfrac{1}{3x+2}$

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

La $u(x) = 3x+2, \quad u' = 3$

$$\int i(x)dx = \int \frac{1}{3}\cdot\frac{3}{3x+2}dx = \frac{1}{3}\ln|3x+2| + c$$