Quiz #5

Please print your name:

Problem 1. (6 points) Evaluate the following indefinite integrals.

(a) $\displaystyle \int \frac{\mathrm{d}x}{3\sqrt{x}} =$ ⎕

(b) $\displaystyle \int \sin(4x)\,\mathrm{d}x =$ ⎕

(c) $\displaystyle \int \frac{\mathrm{d}x}{3x+1} =$ ⎕

Solution.

(a) $\displaystyle \int \frac{\mathrm{d}x}{3\sqrt{x}} = \frac{1}{3}\int x^{-1/2}\mathrm{d}x = \frac{2}{3}x^{1/2} + C$, which we can, of course, also write as $\frac{2}{3}\sqrt{x} + C$.

(b) $\displaystyle \int \sin(4x)\,\mathrm{d}x = -\frac{1}{4}\cos(4x) + C$

(c) $\displaystyle \int \frac{\mathrm{d}x}{3x+1} = \frac{1}{3}\ln|3x+1| + C$

Problem 2. (4 points) Evaluate the following indefinite integral: $\displaystyle \int x\sin(3x)\mathrm{d}x$

Solution. We choose $f(x) = x$ and $g'(x) = \sin(3x)$, so that $g(x) = -\frac{1}{3}\cos(3x)$, to get

$$\int x\sin(3x)\,\mathrm{d}x = -\frac{1}{3}x\cos(3x) + \frac{1}{3}\int \cos(3x)\,\mathrm{d}x = -\frac{1}{3}x\cos(3x) + \frac{1}{9}\sin(3x) + C.$$