

Quiz #5

Please print your name:

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

(a) $\int \sin(2x) \, dx =$

(b) $\int \frac{dx}{5\sqrt{x}} =$

(c) $\int \frac{dx}{2x-1} =$

Solution.

(a) $\int \sin(2x) \, dx = -\frac{1}{2}\cos(2x) + C$

(b) $\int \frac{dx}{5\sqrt{x}} = \frac{1}{5} \int x^{-1/2} dx = \frac{2}{5}x^{1/2} + C$, which we can, of course, also write as $\frac{2}{5}\sqrt{x} + C$.

(c) $\int \frac{dx}{2x-1} = \frac{1}{2}\ln|2x-1| + C$

Problem 2. (4 points) Evaluate the following indefinite integral: $\int x \sin(4x) dx$

Solution. We choose $f(x) = x$ and $g'(x) = \sin(4x)$, so that $g(x) = -\frac{1}{4}\cos(4x)$, to get

$$\int x \sin(4x) \, dx = -\frac{1}{4}x \cos(4x) + \frac{1}{4} \int \cos(4x) \, dx = -\frac{1}{4}x \cos(4x) + \frac{1}{16}\sin(4x) + C.$$