

Quiz 10

Name of Student (Print):

Solⁿ.

Today's Date: November 28, 2017

1. Fill in the blanks.

$$(a) \int x^r dx = \frac{1}{r+1} x^{r+1} + C, r \in \mathbb{R} \setminus \{-1\}$$

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

$$(c) \int e^x dx = e^x + C$$

$$(d) \int f(x) + g(x) dx = \int f(x) dx + \int g(x) dx$$

$$(e) \int kf(x) dx = k \int f(x) dx, k \text{ is a constant}$$

2. Evaluate the following integral:

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

$$\text{let } u = x^3 + 3x$$

$$du = (3x^2 + 3) dx$$

$$= 3(x^2 + 1) dx$$

$$(x^2 + 1) dx = \frac{1}{3} du$$

$$= \int \frac{1}{3} u^{-1} du$$

$$= \frac{1}{3} \int \frac{1}{u} du$$

$$= \frac{1}{3} \ln |u| + C$$

$$= \frac{1}{3} \ln |x^3 + 3x| + C$$

