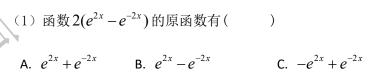
习题 4.2

1. 选择题



- D. $-e^{2x} e^{-2x}$

(2) 设
$$\int f(x)dx = \ln x^2 + C$$
, 则下面式子正确的是()

- A. $\int e^x f(e^x) dx = e^{2x} + C$ B. $\int e^x f(e^x) dx = 2x + C$
- C. $\int e^{-x} f(e^{-x}) dx = -2x + C$ D. $\int e^{-x} f(e^{-x}) dx = e^{-2x} + C$

2. 填空题

(1) 若
$$\int f(x)dx = F(x) + C$$
,则 $\int x f(1-x^2)dx =$ _______.

(2) 已知
$$f'(2x) = \sec^2 x$$
,则 $f(x) =$ _______.

(3) 若
$$f'(\tan 2x) = \sec^2 x$$
,则 $\int \sec^2(2x) f''(\tan 2x) dx =$ _____

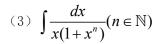
(4) 已知
$$\sin x$$
 是 $f(x)$ 的原函数,则 $\int \frac{f'(\ln x)}{x} dx =$ _____.

(5)
$$\int \tan x \sec^2 x dx = \underline{\qquad}, \int \frac{e^{\frac{1}{x}}}{x^2} dx = \underline{\qquad}.$$

3. 利用第一类换元计算下列不定积分

$$(1) \int \frac{2^{\arccos x}}{\sqrt{1-x^2}} dx$$

(2)
$$\int \frac{x}{\sqrt{x^2 - 1}} dx$$

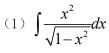


$$(4) \int \frac{\ln 2x}{x \ln 4x} dx$$



4. 利用第二类换元计算下列不定积分





$$(2) \int \frac{dx}{x^4 \sqrt{x^2 - 1}}.$$



$$(3) \int \frac{1}{(\sqrt{1+x^2})^3} dx$$





5. 计算下列不定积分

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

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

