## 习题 5.2

## 1. 选择题:

- (1) 设 $F(x) = \int_{a}^{x} \cos(f(t))dt$ ,则F'(x) = (

- A.  $\sin(f(x))$  B.  $\cos(f(x))$  C.  $\cos(f(x))f'(x)$  D.  $-\sin(f(x))f'(x)$ .

- A. 极小值  $\frac{1}{2}$  B. 极小值  $-\frac{1}{2}$  C. 极大值  $\frac{1}{2}$  D. 极大值  $-\frac{1}{2}$
- (3) 设 $F(x) = \int_{a}^{x} x f(t) dt$ ,则F'(x) = (
  - A.  $\int_a^x f(t)dt + xf(x)$  B. xf(x) C. (x-a)f(x) D. (x-a)[f(x)-f(a)]

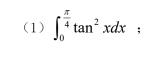
- (4) 下列关系错误的是(
- A.  $(\int_{a}^{-x} f(t)dt)' = -f(-x)$ B.  $(\int_{x}^{a} f(t)dt)' = -f(x)$ C.  $(\int_{x}^{2x} f(t)dt)' = 2f(2x) f(x)$ D.  $(\int_{a}^{b} f(t)dt)' = f(b) f(a)$

## 2. 填空题:

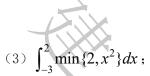
- (1) 设 f(x) 在 [a,b] 上连续,则  $d[\int_a^b f(x)dx] = \frac{d}{dx}[\int_{-x}^1 f(t)dt] = \frac{d}{dx}$
- (3) 当  $a = _{\underline{}}$ 时,  $f(x) = \int_{0}^{x} (a \cos t + \cos 3t) dt$  在  $x = \frac{\pi}{3}$  处有极值;
- (4)  $\int_{1}^{3} |(x-1)(x-3)| dx =$ \_\_\_\_\_\_;
- 3. 求下列极限:
  - (1)  $\lim_{x \to 0} \frac{\int_0^x \sin t^2 dt}{\int_0^x t(e^{2t} 1) dt} ;$
- $(2) \lim_{x\to 0} \frac{\int_0^{\sin x} \sin t^2 dt}{x^3 + x^4}.$



## 4. 计算下列积分:



$$(2) \int_{\frac{\pi^2}{4}}^{\pi^2} \frac{\cos\sqrt{x}}{\sqrt{x}} dx;$$



$$(4) \int_a^b |x| dx \ (a < b);$$



$$(5) \int_0^{\pi} \sqrt{1-\sin 2x} dx;$$

$$(6) \int_{-\frac{\pi}{4}}^{\frac{\pi}{4}} \frac{1}{1+\sin x} dx.$$

