

**Student:** \_\_\_\_\_  
**Date:** \_\_\_\_\_

**Instructor:** Pangyen Weng  
**Course:** Calculus II

**Assignment:** 1.4 The Definite Integral

1. The functions  $f$  and  $g$  are integrable and  $\int_2^4 f(x)dx = -5$ ,  $\int_2^7 f(x)dx = -3$ , and  $\int_2^7 g(x)dx = -3$ . Find the values of the following definite integrals.

$$\int_2^4 f(x)dx = \boxed{\phantom{000}}$$

(Simplify your answer.)

$$\int_7^2 g(x)dx = \boxed{\phantom{000}}$$

(Simplify your answer.)

$$\int_2^7 4g(x)dx = \boxed{\phantom{000}}$$

(Simplify your answer.)

$$\int_4^7 f(x)dx = \boxed{\phantom{000}}$$

(Simplify your answer.)

$$\int_2^7 [g(x) - f(x)]dx = \boxed{\phantom{000}}$$

(Simplify your answer.)

$$\int_2^7 [3g(x) - f(x)]dx = \boxed{\phantom{000}}$$

(Simplify your answer.)

2. Suppose that  $\int_5^6 f(x)dx = 8$ . Find the value of the following definite integrals. Complete parts (a) through (d).

(a)  $\int_5^6 f(u)du = \boxed{\phantom{000}}$  (Type an exact answer, using radicals as needed.)

(b)  $\int_5^6 \sqrt{2} f(z)dz = \boxed{\phantom{000}}$  (Type an exact answer, using radicals as needed.)

(c)  $\int_6^5 f(t)dt = \boxed{\phantom{000}}$  (Type an exact answer, using radicals as needed.)

(d)  $\int_5^6 [-f(x)]dx = \boxed{\phantom{000}}$  (Type an exact answer, using radicals as needed.)

3. Suppose that  $f$  is integrable, and that  $\int_1^3 f(z)dz = 6$  and  $\int_1^4 f(z)dz = 9$ . Find the value of the following definite integrals.

(a)  $\int_3^4 f(z)dz = \boxed{\phantom{000}}$  (Type an integer or a decimal.)

(b)  $\int_4^3 f(z)dz = \boxed{\phantom{000}}$  (Type an integer or a decimal.)

4. Graph the integrand, and use area to evaluate the definite integral  $\int_{-9}^9 \sqrt{81 - x^2} dx$ .

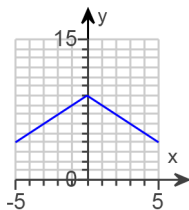
The value of the definite integral  $\int_{-9}^9 \sqrt{81 - x^2} dx$ , as determined by the area under the graph of the integral, is  $\boxed{\phantom{000}}$   
(Type an exact answer, using  $\pi$  as needed.)

5. Graph the integrand and use areas to evaluate the integral.

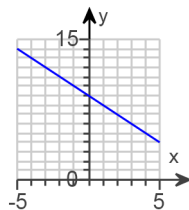
$$\int_{-5}^5 (9 - |x|) dx$$

Choose the correct graph of the integrand below.

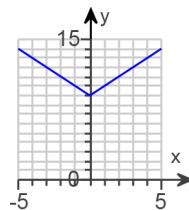
A.



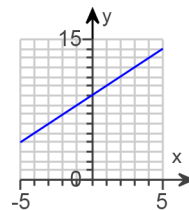
B.



C.



D.



$$\int_{-5}^5 (9 - |x|) dx = \boxed{\phantom{000}} \text{ (Simplify your answer.)}$$

- 6.

Evaluate the integral  $\int_3^{\sqrt{10}} x dx$ .

The value of the integral  $\int_3^{\sqrt{10}} x dx$  is  $\boxed{\phantom{000}}$ .

(Type an integer or a simplified fraction.)

1. 0

3

- 12

2

0

- 6

2. 8

 $8\sqrt{2}$ 

- 8

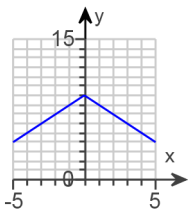
- 8

3. 3

- 3

4.  $\frac{81\pi}{2}$ 

5.



A.

65

6.  $\frac{1}{2}$