

## 5.3 The Definite Integral.

Express the limit as a definite integral.

1)  $\lim_{\|P\| \rightarrow 0} \sum_{k=1}^n (5c_k^2 - 9c_k + 6) \Delta x_k$ , where P is a partition of  $[-7, 3]$  1) \_\_\_\_\_

A)  $\int_1^n (10x - 9) dx$

B)  $\int_3^{-7} (5x^2 - 9x + 6) dx$

C)  $\int_{-7}^3 (5x^2 - 9x + 6) dx$

D)  $\int_{-7}^3 (5x - 9) dx$

2)  $\lim_{\|P\| \rightarrow 0} \sum_{k=1}^n c_k^9 \Delta x_k$ , where P is a partition of  $[-1, 2]$  2) \_\_\_\_\_

A)  $\int_2^{-1} x^9 dx$

B)  $\int_1^n x dx$

C)  $\int_{-1}^2 x^9 dx$

D)  $\int_{-1}^2 9x^8 dx$

3)  $\lim_{\|P\| \rightarrow 0} \sum_{k=1}^n 6c_k^4 \Delta x_k$ , where P is a partition of  $[4, 10]$  3) \_\_\_\_\_

A)  $\int_{10}^4 6x^4 dx$

B)  $\int_4^{10} 6x^4 dx$

C)  $\int_1^n 6x dx$

D)  $\int_4^{10} 24x^3 dx$

Solve the problem.

4) Suppose that  $\int_5^7 f(x) dx = -5$ . Find  $\int_5^5 f(x) dx$  and  $\int_7^5 f(x) dx$ . 4) \_\_\_\_\_

A) -5; 5

B) 5; -5

C) 0; -5

D) 0; 5

5) Suppose that f and g are continuous and that  $\int_4^8 f(x) dx = -6$  and  $\int_4^8 g(x) dx = 10$ . 5) \_\_\_\_\_

Find  $\int_4^8 [f(x) - 2g(x)] dx$ .

A) -16

B) -32

C) -26

D) 14

Graph the integrand and use areas to evaluate the integral.

6)  $\int_{-1}^7 5 dx$  6) \_\_\_\_\_

A) 8

B) 40

C) 20

D) 30

7)  $\int_4^8 x \, dx$  7) \_\_\_\_\_  
 A) 48 B) 12 C) 6 D) 24

8)  $\int_{-7}^7 \sqrt{49 - x^2} \, dx$  8) \_\_\_\_\_  
 A)  $\frac{49}{2}\pi$  B) 49 C)  $49\pi$  D)  $7\pi$

Find an expression that represents the area of the region between the given curve and the x-axis on the interval  $[0, b]$ .

9)  $y = 6x^2$  9) \_\_\_\_\_  
 A)  $12b$  B)  $-12b$  C)  $-2b^3$  D)  $2b^3$

10)  $y = \frac{x}{3} + 5$  10) \_\_\_\_\_  
 A)  $-\frac{b}{3} - 5$  B)  $\frac{b^2}{6} + 5b$  C)  $-\frac{b^2}{6} - 5b$  D)  $\frac{b}{3} + 5$

Compute:

11)  $\int_{-3}^3 x^3 \, dx$  11) \_\_\_\_\_  
 A)  $\frac{81}{4}$  B) 27 C)  $\frac{81}{2}$  D) 0

Compute the definite integral as the limit of Riemann sums.

12)  $\int_q^r p \, dx$  12) \_\_\_\_\_  
 A)  $p(r - q)$  B)  $r - q$  C)  $p\left(\frac{r^2}{2} - \frac{q^2}{2}\right)$  D)  $p$

13)  $\int_a^b 4x^2, a < b$  13) \_\_\_\_\_  
 A)  $64\left(\frac{b^3}{3} - \frac{a^3}{3}\right)$  B)  $16(b - a)$  C)  $b^2 - a^2$  D)  $4\left(\frac{b^3}{3} - \frac{a^3}{3}\right)$

Answer Key

Testname: PRACTICE21

- 1) C
- 2) C
- 3) B
- 4) D
- 5) C
- 6) B
- 7) D
- 8) A
- 9) D
- 10) B
- 11) D
- 12) A
- 13) D