

201-203-RE - Supplement B - Properties of Definite Integrals

1. Find the value(s) of k such that $\int_1^2 [2k^2x - 3x^2] dx = 20$.
2. Find the value(s) of k such that $\int_{-1}^0 [5k + 3k^2x^2] dx = 6$.
3. If $\int_2^5 f(x) dx = 6$ and $\int_3^5 f(x) dx = 4$, evaluate $\int_2^3 f(x) dx$.
4. If $\int_{-1}^4 f(x) dx = 4$ and $\int_{-1}^4 g(x) dx = 6$, evaluate $\int_{-1}^4 [3f(x) - 2g(x) + 3] dx$.
5. Find the area of the region bounded by $f(x) = 3x^2 - 6x$ and the x -axis, from $x = -1$ to $x = 1$.
6. Given $\int_{-3}^0 9k\sqrt{x+4} - 6k^3 dx = 0$, find the value(s) of k .
7. Given $\int_0^4 \frac{6k}{4+3x} dx = 4$, find the value(s) of k .
8. Given $\int_1^2 k^2 - k(x-1)^3 dx = 0$, find the value(s) of k .
9. If $\int_1^5 f(x) dx = 20$ and $\int_1^0 f(x) dx = 17$, evaluate $\int_0^5 f(x) dx$.
10. If $\int_3^5 3f(x) dx = 5$ and $\int_3^5 2g(x) dx = 3$, evaluate $\int_3^5 [6f(x) + 4g(x) + 7] dx$.
11. If $\int_{-4}^1 4f(x) dx = 2$ and $\int_{-4}^1 3g(x) dx = 9$, evaluate $\int_{-4}^1 [2f(x) - 6g(x) + 12] dx$.
12. If $\int_2^3 f(x) dx = 10$ and $\int_2^{-1} f(x) dx = 12$, evaluate $\int_{-1}^3 [4f(x) + 9] dx$.
13. If $\int_{-3}^0 f(x) dx = 8$ and $\int_1^0 f(x) dx = 5$, evaluate $\int_{-3}^1 [4f(x) + 7] dx$.
14. If $\int_{-1}^2 2f(x) dx = 10$ and $\int_{-1}^2 g(x) dx = 7$, evaluate $\int_{-1}^2 [f(x) - 2g(x) + 3] dx$.

15. If $\int_1^3 4f(x) dx = 8$ and $\int_1^3 2g(x) dx = 3$, evaluate $\int_1^3 [3f(x) - 4g(x) + 5] dx$.

16. If $\int_{-1}^0 f(x) dx = 11$ and $\int_{-3}^{-1} f(x) dx = 3$, evaluate $\int_{-3}^0 [4f(x) - 1] dx$.

17. If $\int_4^5 f(x) dx = 6$ and $\int_0^5 f(x) dx = 1$, evaluate $\int_0^4 [2f(x) + 3] dx$.

18. If $\int_{-3}^2 f(x) dx = 3$ and $\int_0^{-3} f(x) dx = 7$, evaluate $\int_0^2 [2f(x) + 5] dx$.

19. $\int_1^5 (4 - |x - 3|) dx$

22. $\int_{-1}^5 (6 - |3x - 2|) dx$

25. $\int_{-2}^3 (|4 - 4x| - 2x) dx$

20. $\int_{-4}^1 (|x + 2| - 5) dx$

23. $\int_3^7 (|5 - x| - 2) dx$

26. $\int_{-1}^4 (4 - |5 - 3x|) dx$

21. $\int_{-2}^4 (|2x - 5| + 3) dx$

24. $\int_{-8}^{-2} (4 - |-x - 6|) dx$

ANSWERS:

(1) $k = \pm 3$

(9) 3

(19) 12

(2) $k = -6, 1$

(10) 30

(20) $-\frac{37}{2}$

(3) 2

(11) 43

(21) $\frac{81}{2}$

(4) 15

(12) 28

(22) $\frac{11}{3}$

(5) 6

(13) 40

(23) -4

(6) $k = 0, \pm\sqrt{\frac{7}{3}}$

(14) 0

(24) 14

(7) $k = \frac{1}{\ln(2)}$

(16) 53

(25) 21

(8) $k = 0, \frac{1}{4}$

(17) 2

(26) $\frac{7}{6}$

(18) 30