

Rules for Definite Integrals: Multiple Choice Practice

1. If $\int_1^{10} f(x)dx = 4$ and $\int_{10}^3 f(x)dx = 7$, then $\int_1^3 f(x)dx =$

- (A) -3 (B) 0 (C) 3 (D) 10 (E) 11
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2. If $a < b < c < d$, $\int_a^d f(x)dx = -7$, $\int_b^d f(x)dx = -2$, and $\int_c^a f(x)dx = 17$, then what is $\int_b^c f(x)dx$?

- (A) -12 (B) -6 (C) -3 (D) 4 (E) none of these
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3. If $\int_{30}^{100} f(x)dx = A$ and $\int_{50}^{100} f(x)dx = B$, then $\int_{30}^{50} f(x)dx =$

- (A) $A + B$ (B) $A - B$ (C) 0 (D) $B - A$ (E) 20
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4. If $h(x)$ is an **odd** function and $\int_3^5 h(x)dx = -2$, then $\int_{-3}^5 h(x)dx =$

- (A) -4 (B) -2 (C) 0 (D) 8 (E) not enough information
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5. If f and g are continuous functions, $f(x) \geq 0$ for all real numbers x , and $a < b$, which of the following must be true?

I. $\int_a^b f(x)dx \geq 0$

II. $\int_a^b (f(x) - g(x))dx = \int_a^b f(x)dx + \int_b^a g(x)dx$

III. $\int_a^b (f(x))^3 dx = \left(\int_a^b f(x)dx\right)^3$

- (A) I only (B) II only (C) I and II (D) II and III (E) I, II, and III