DATE: _____

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

$\int_1^3 f(x)\,dx + \int_3^{10} f(x)\,dx = \int_1^{10} f(x)\,dx$

$\int_1^3 f(x)\,dx - 7 = 4 \longrightarrow \int_1^3 f(x)\,dx = 11$

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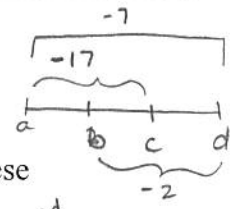
2. If $a < b < c < d$, $\int_a^d f(x)dx = -7$, $\int_b^d f(x)dx = -2$, and $\int_c^a f(x)dx = 17$, then what is $\int_b^c f(x)dx$?

↳ $\int_a^c f(x)\,dx = -17$



(A) -12 **(B)** -6 **(C)** -3 **(D)** 4 **(E)** none of these

$\int_a^c f(x)\,dx + \int_c^d f(x)\,dx = \int_a^d f(x)\,dx$

$-17 + \int_c^d f(x)\,dx = -7$

$\int_c^d f(x)\,dx = 10$

$\int_b^c f(x)\,dx + \int_c^d f(x)\,dx = \int_b^d f(x)\,dx$

$\int_b^c f(x)\,dx + 10 = -2$

$\int_b^c f(x)\,dx = -12$

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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

$\int_{30}^{50} f(x)\,dx + \int_{50}^{100} f(x)\,dx = \int_{30}^{100} f(x)\,dx$

$\int_{30}^{50} f(x)\,dx + B = A$

$\int_{30}^{50} f(x)\,dx = A - B$

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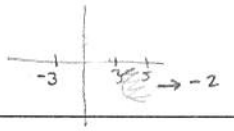
4. If $h(x)$ is an **odd** function and $\int_3^5 h(x)dx = -2$, then $\int_{-3}^5 h(x)dx =$

(A) -4 **(B)** -2 **(C)** 0 **(D)** 8 **(E)** not enough information

$\int_{-3}^{3} h(x)\,dx = 0$



$\int_{-3}^{3} h(x)\,dx + \int_3^5 h(x)\,dx = \int_{-3}^5 h(x)\,dx$

$0 + -2 = \int_{-3}^5 h(x)\,dx$

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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?

↳ $f(x)$ above x-axis

I. $\int_a^b f(x)dx \geq 0$ ✓ positive area b/c $f(x)$ above x-axis

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

III. $\int_a^b (f(x))^3 dx = \left(\int_a^b f(x)dx\right)^3$ ∴ NO SUCH RULE!

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