Quiz 3A

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Closed book/notes. No calculators allowed.

Suppose $\int_0^{0.5} f(t)\,dt = 3$ and $\int_{0.5}^{1} f(t)\,dt = 5$. Compute $\int_0^{0.5} f(2t)\,dt$.

$$\int_0^{0.5} f(2t)\,dt = \int_0^1 f(u)\,\tfrac{1}{2}\,du = \tfrac{1}{2}\int_0^1 f(u)\,du = \tfrac{1}{2}(3+5) = \tfrac{1}{2}\cdot 8 = \boxed{4}$$

let $u = 2t$ → $u(0) = 2(0) = 0$, $u(0.5) = 2(0.5) = 1$

$du = 2dt$

$\tfrac{1}{2}du = dt$

$$\int_0^{0.5} f(t)\,dt + \int_{0.5}^{1} f(t)\,dt = \int_0^1 f(t)\,dt$$

$$3 + 5 = \int_0^1 f(t)\,dt$$

$$8 = \int_0^1 f(t)\,dt$$

Grade: /10