

STEP/Integration Q3 (21/6/23)

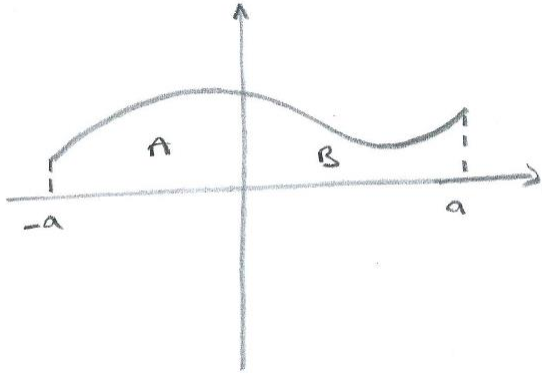
Simplify:

(i) $\int_{-a}^a f(-x) dx$

(ii) $\int_0^a f(a-x) dx$

Solution

$$(i) \int_{-a}^a f(-x) dx = \int_{-a}^a f(x) dx$$



$$(ii) \int_0^a f(a-x) dx = \int_0^a f(x) dx$$

[Let $u = a - x$, so that $du = -dx$ and

$$\int_0^a f(a-x) dx = \int_a^0 f(u) (-du) = \int_0^a f(u) du = \int_0^a f(x) dx]$$