

$$\alpha) \int_5^{10} f(x) dx + \int_{10}^3 f(x) dx + \int_3^5 f(x) dx = \int_5^3 f(x) dx + \int_3^5 f(x) dx = 0$$

$$\begin{aligned} \beta) \int_1^3 f(x) dx \cdot \int_5^{10} f(x) dx + \int_1^5 f(x) dx \cdot \int_{10}^3 f(x) dx + \int_1^{10} f(x) dx \cdot \int_3^5 f(x) dx &= \\ &= \int_1^3 f(x) dx \cdot \int_5^{10} f(x) dx + \left(\int_1^3 f(x) dx + \int_3^5 f(x) dx \right) \cdot \int_{10}^3 f(x) dx + \\ &+ \left(\int_1^3 f(x) dx + \int_3^{10} f(x) dx \right) \cdot \int_3^5 f(x) dx = \\ &= \int_1^3 f(x) dx \cdot \int_5^{10} f(x) dx + \int_1^3 f(x) dx \cdot \int_{10}^3 f(x) dx + \int_3^5 f(x) dx \cdot \int_{10}^3 f(x) dx + \\ &+ \int_1^3 f(x) dx \cdot \int_3^5 f(x) dx + \int_3^{10} f(x) dx \cdot \int_3^5 f(x) dx = \\ &= \int_1^3 f(x) dx \cdot \left(\int_5^{10} f(x) dx + \int_{10}^3 f(x) dx + \int_3^5 f(x) dx \right) + \int_3^5 f(x) dx \cdot \int_{10}^3 f(x) dx \\ &- \int_{10}^3 f(x) dx \cdot \int_3^5 f(x) dx = \int_1^3 f(x) dx \cdot 0 = 0 \end{aligned}$$