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Дис 2

ДР9

$\iint_D |x+2|\,dx\,dy$, където D е определено от:

$y \le -|x|$ и $2y \ge x-6$

$D = T_1 \cup T_2 \cup T_3$, където

$T_1 = \begin{cases} -6 \le x \le -2 \\ \frac{x}{2} - 3 \le y \le x \end{cases}$, $T_2 = \begin{cases} -2 \le x \le 0 \\ \frac{x}{2} - 3 \le y \le x \end{cases}$, $T_3 = \begin{cases} 0 \le x \le 2 \\ \frac{x}{2} - 3 \le y \le -x \end{cases}$

$$\iint_{T_1} |x+2|\,dx\,dy = \int_{-6}^{-2} \left(\int_{\frac{x}{2}-3}^{x} (-x-2)\,dy \right) dx = -\frac{1}{2} \int_{-6}^{-2} (x^2+8x+12)\,dx = \frac{16}{3}$$

$$\iint_{T_2} |x+2|\,dx\,dy = \int_{-2}^{0} \left(\int_{\frac{x}{2}-3}^{x} x+2\,dy \right) dx = \frac{1}{2} \int_{-2}^{0} x^2+8x+12\,dx = \frac{16}{3}$$

$$\iint_{T_3} |x+2|\,dx\,dy = \int_{0}^{2} \left(\int_{\frac{x}{2}-3}^{-x} x+2\,dy \right) dx = \frac{3}{2} \int_{0}^{2} (-x^2+4)\,dx = \frac{16}{3}$$

$$\iint_D = \iint_{T_1} |x+2|\,dx\,dy + \iint_{T_2} |x+2|\,dx\,dy + \iint_{T_3} |x+2|\,dx\,dy =$$

$= 16$

$=$

$= 1 =$