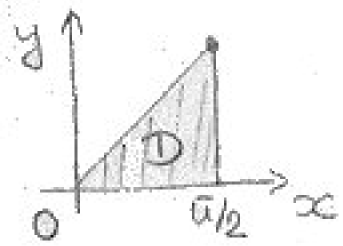
ПРВИ ЗАДАТАК

6.2.(7)

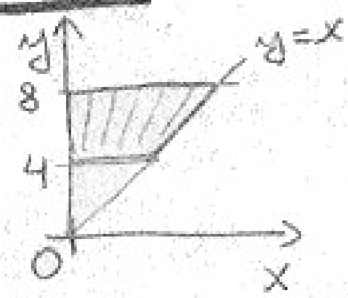


$$\iint_D \sin(x+y)\,dx\,dy = \int_0^{\pi/2} dx \int_0^x \cos(x+y)\,dy = \int_0^{\pi/2} dx \cdot \sin(x+y)\Big|_0^x =$$

$$= \int_0^{\pi/2} [\sin(2x) - \sin x]\,dx = \left(\frac{-\cos 2x}{2} + \cos x\right)\Big|_0^{\pi/2} =$$

$$= -\frac{1}{2}(\cos\pi - \cos 0) + \cos\frac{\pi}{2} - \cos 0 = -\frac{1}{2}(-1-1)+0-1 = 0$$

6.2.(16)

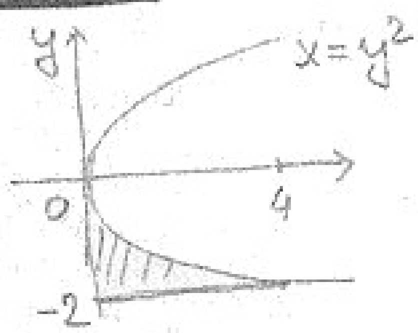


$$\iint_D \frac{y^3}{x^2+y^2}\,dx\,dy = \int_4^8 dy \int_0^y \frac{y^3}{x^2+y^2}\,dx = \int_4^8 y^2 dy \cdot \operatorname{arctg}\left(\frac{x}{y}\right)\Big|_0^y =$$

$$= \int_4^8 y^2 dy(\operatorname{arctg}1 - \operatorname{arctg}0) = \frac{\pi}{4}\cdot\frac{1}{3} y^3\Big|_4^8 = \frac{\pi}{12}(8^3-4^3) = \frac{112\pi}{3}$$

II начин: $$\iint_D \frac{y^3\,dx\,dy}{x^2+y^2} = \int_0^4 dx\int_4^8 \frac{y^3\,dy}{x^2+y^2} + \int_4^8 dx \int_x^8 \frac{y^3\,dy}{x^2+y^2} = \dots$$

6.2(23)



$$\iint_D (3x^2-2xy+y)\,dx\,dy = \int_0^4 dx \int_{-2}^{-\sqrt{x}} (3x^2-2xy+y)\,dy =$$

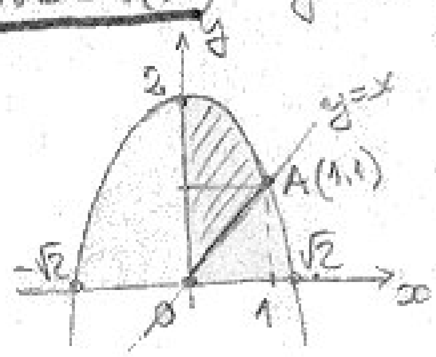
$$= \int_0^4 dx\left(3x^2y - xy^2 + \frac{1}{2} y^2\right)\Big|_{-2}^{-\sqrt{x}} = \int_0^4 dx\left[-3x^2\sqrt{x} - x^2 + \frac{1}{2} x - (-6x^2-4x+2)\right]$$

$$= \int_0^4\left(-3x^{5/2}+5x^2+\frac{9}{2} x - 2\right) = -3\cdot\frac{x^{7/2}}{7/2} + \frac{5}{3} x^3 + \frac{9}{4} x^2 - 2x = 5 - \frac{1}{21}$$

ДРУГИ ЗАДАТАК

6.3B.(19)

$y=x$; $y=2-x^2 \rightarrow x=\pm\sqrt{2-y}$

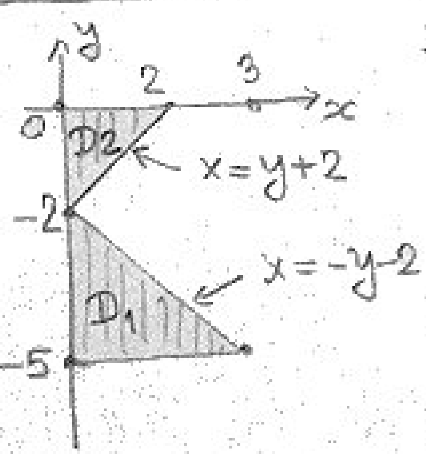


$$I = \int_0^1 dx\int_x^{2-x^2} f(x,y)\,dy = \iint_D f(x,y)\,dx\,dy =$$

$$= \int_0^1 dy\int_0^y f(x,y)\,dx + \int_1^2 dy \int_0^{+\sqrt{2-y}} f(x,y)\,dx$$

6.3B.(16)

$x=0$
$x=|y+2|$



$$I = \int_{-5}^0 dy\int_0^{|y+2|} f(x,y)\,dx = \iint_D f(x,y)\,dx\,dy =$$

$$= \iint_{D_1} f(x,y)\,dx\,dy + \iint_{D_2} f(x,y)\,dx\,dy$$

$$= \int_0^3 dx\int_{-5}^{-x-2} f(x,y)\,dy + \int_0^2 dx\int_{x-2}^0 f(x,y)\,dy$$