$-xy\cos(x,y) - \sin(x\cdot y)$

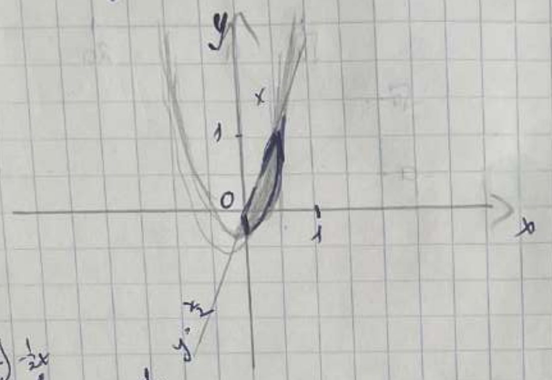
~~Д~~омашняя работа

1) $\iint\limits_G dx\,dy$

$y = 8a^3(x^2+4a^2)$

$x = 2y \qquad y = \frac{1}{2}x$

$x = 0$



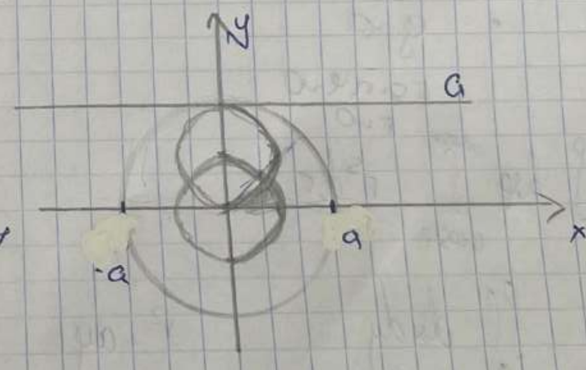
$$\int_0^{8a^3(x^2+4a^2)-\frac{1}{2}x} dx \int_{8a^3(x^2+4a^2)}^{\frac{1}{2}x} f(x,y)\,dy$$

$8a^3(x^2+4a^2) = \frac{1}{2}x$

$8a^3(x^2+4a^2) - \frac{1}{2}x = 0 \qquad 16a^3x^2 - x + 64z^5 = 0$

$x = \frac{1+\sqrt{1-4096z^{?}}}{32z^3}$

2) $$\int_0^a dy \int_{\sqrt{ay-y^2}}^{\sqrt{a^2-y^2}} \sqrt{a^2-x^2-y^2}\,dx$$



$\sqrt{a^2-x^2-y^2} = \sqrt{a^2-(r\cos\varphi)^2-(r\sin\varphi)^2} =$
$\sqrt{a^2-r^2(\cos^2\varphi+\sin^2\varphi)} = \sqrt{a^2-r^2}$

• $\sqrt{ay-y^2} = x$

$a(r\sin\varphi) - r^2\sin^2\varphi = r^2\cos^2\varphi$

$a(r\sin\varphi) = r^2$

$r = a\sin\varphi$

$y = 0$
$r\sin\varphi = 0$
$r = 0$

$y = a$
$r\sin\varphi = a$
$r = \frac{a}{\sin\varphi}$

• $a^2 - r^2\sin^2\varphi = r^2\cos^2\varphi$

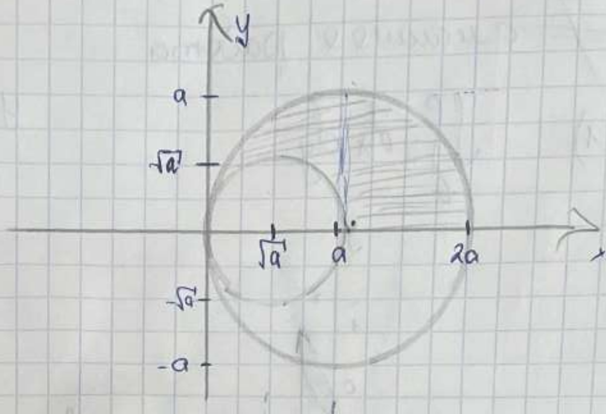
$a^2 = r^2$
$r = a$

$$\int_0^{\frac{\pi}{4}} d\varphi \int_0^{a/\sin\varphi} r\sqrt{a^2-r^2}\,dr$$

3) $\iint\limits_G (x^2+y^2)\,dx\,dy$

$x^2+y^2=ax$
$y=0$

$x^2+y^2=2ax$



· $r^2\cos^2\varphi + r^2\sin^2\varphi = r^2$

$\int_0^a dy \int_{\frac{a+\sqrt{a^2-4y^2}}{2}}^{a+\sqrt{a^2-y^2}} dx$

· $x^2+y^2=2ax$ Полярный угол от $-\frac{\pi}{2}$ до $\frac{\pi}{2}$

$r^2\cos^2\varphi + r^2\sin^2\varphi = 2ar\cos\varphi$

$r = 2a\cos\varphi$

· $x^2+y^2=ax$

$r^2\cos^2\varphi + r^2\sin^2\varphi = ar\cos\varphi$

$r = a\cos\varphi$

· $r\sin\varphi = a$
$r = \frac{a}{\sin\varphi}$

· $y=0$
$r\sin\varphi=0$
$r=0$

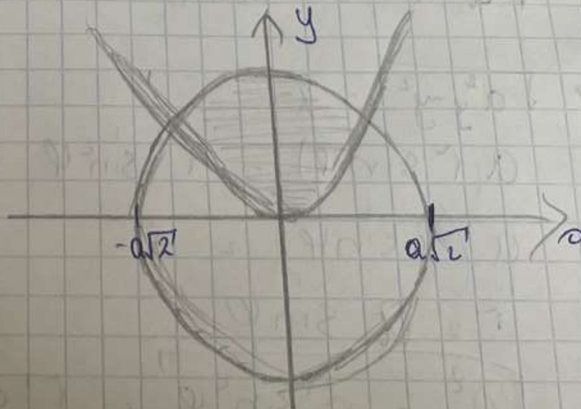
$\int_0^{\frac{a}{\sin\varphi}} d\varphi \int_{a\cos\varphi}^{2a\cos\varphi} r^3\,dr$

4) $\iint\limits_G dx\,dy$

$x^2=ay$

$x^2+y^2=2a^2$

$y=0$



$\int_0^{a\sqrt{2}} d\varphi \int_{\frac{a\sin\varphi}{\cos^2\varphi}}^{a\sqrt{2}} r\, f(x,y)\,dr$

1) $r^2\cos^2\varphi = ar\sin\varphi$

$r = \frac{a\sin\varphi}{\cos^2\varphi}$

2) $r^2 = 2a^2$

$r = a\sqrt{2}$

3) $r=0$