DN. 1

ZAMENJAJ VRSTNI RED INTEGRACIJE

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

$x = \frac{y^2}{2}$

$y^2 = 2x$

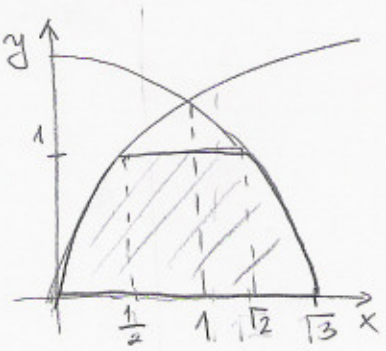
$y = \pm\sqrt{2x}$

$x = \sqrt{3-y^2}$

$x^2 = 3-y^2$

$x^2 + y^2 = 3$

$y = \pm\sqrt{3-x^2}$



PRESEČIŠČE

$x^2 + y^2 = 3$

$x^2 + 2x - 3 = 0 \Rightarrow (x+3)(x-1) = 0 \Rightarrow x_1 = -3,\ x_1 = 1$

(b) $$\int_{-7}^{1} dy \int_{2-\sqrt{7-6y-y^2}}^{2+\sqrt{7-6y-y^2}} f(x,y)\,dx = \int_{-2}^{6} dx \int_{-3-\sqrt{12+4x-x^2}}^{-3+\sqrt{12+4x-x^2}} f(x,y)\,dy$$

$x = 2 - \sqrt{7-6y-y^2}$

$(x-2)^2 = 7-6y-y^2$

$(x-2)^2 + y^2 + 6y = 7$

$(x-2)^2 + (y^2+6y+9) = 7+9$

$(x-2)^2 + (y+3)^2 = 16$

$y+3 = \pm\sqrt{16-(x-2)^2}$

$y = -3 \pm \sqrt{12+4x-x^2}$