ÚLOHY K ŘEŠENÍ

1. Určete, zda zadaná množina bodů v $\mathbb{R}^2$ je uzavřená, omezená, kompaktní.

(a) $(x^2 + y^2 \leq 1) \wedge (x \leq y)$

(b) $(x^2 + y^2 \geq 1) \wedge (x \leq y)$

(c) $(x^2 + y^2 \geq 1) \wedge (x^2 + y^2 \leq 4)$

(d) $(x + 1 > 0) \wedge (x + y^2 \leq 4)$

(e) $(1 - y \geq 0) \wedge (y \geq x^2 - 1)$

(f) $(1 - y > 0) \wedge (y \geq x^2 - 1)$

(g) $(x < y) \wedge (y \leq 2) \wedge (x \geq 0)$

(h) $(y \geq x) \wedge (y \leq x + 1) \wedge (0 \leq x \leq 2)$

(i) $(y \geq x) \wedge (y \leq x + 1) \wedge (0 < y < 1)$

(j) $(y \geq x) \wedge (y \leq x + 1)$

(k) $\left(\frac{x^2}{4} + y^2 \leq 1\right) \wedge (x \geq 0)$

(l) $\left(\frac{x^2}{4} + y^2 \leq 1\right) \wedge (1 \leq x < 3)$

(m) $(y \leq -x + 4) \wedge (y \leq 2x - 2) \wedge (y \geq \frac{x}{2} - 2)$

(n) $(y \geq -x + 4) \wedge (y \geq 2x - 2) \wedge (y > \frac{x}{2} - 2)$

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10 Načrtněte definiční obory zadaných funkcí dvou proměnných

(a) $z = \sqrt{1 - x} + \sqrt{1 - y}$

(b) $z = \log(1 - x) + \sqrt{1 - y^2}$

(d) $z = (\sqrt{4 - y^2}) \log(1 - x^2)$

(e) $z = \sqrt{x - \sqrt{y}}$

(f) $z = \log(x - 3y + 7)$

(h) $f(x_1, x_2) = \dfrac{x_1 - x_2 - 1}{x_1^2 + x_2 - 1}$

(i) $f(x_1, x_2) = \sqrt{x^2 - y - 1}$

(j) $f(x_1, x_2) = \sqrt{x - y^2 - 1}$

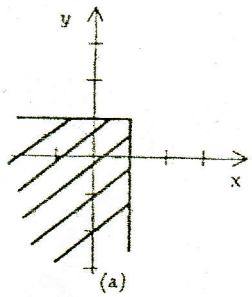
(k) $g(u, v) = \sqrt{\dfrac{u - 1}{v + 1}}$

(l) $g(u, v) = \log \dfrac{u - 1}{u + v + 1}$

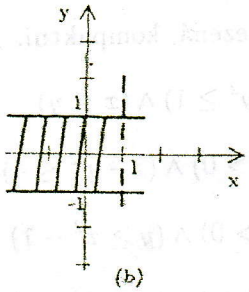
(m) $h(a, b) = a^b$

(n) $h(a, b) = \log(\log(a + b))$

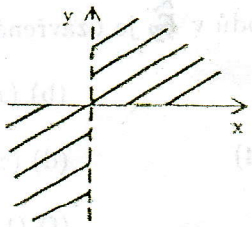
10.



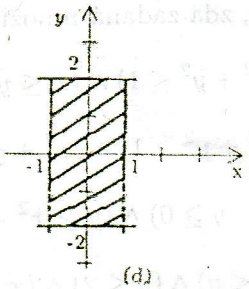
(a)



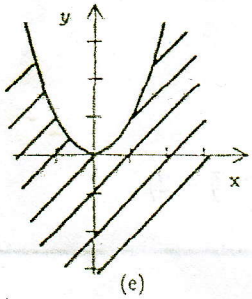
(b)



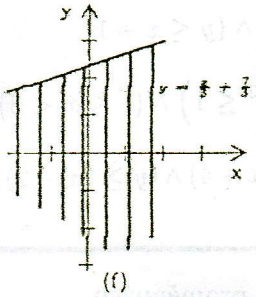
(c)



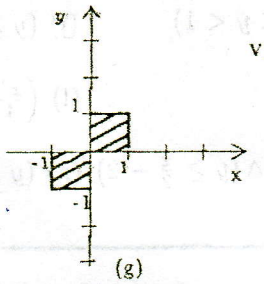
(d)



(e)



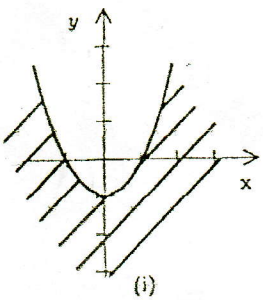
(f)



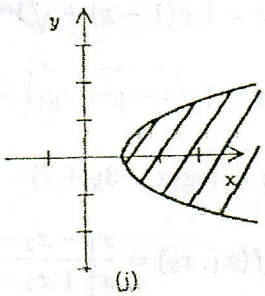
(g)

rovina os x_1, x_2
vyjma paraboly $x_2 = 1 - x_1^2$

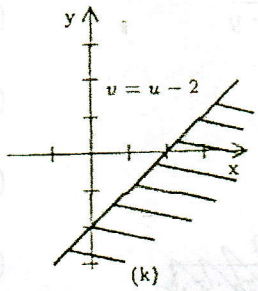
(h)



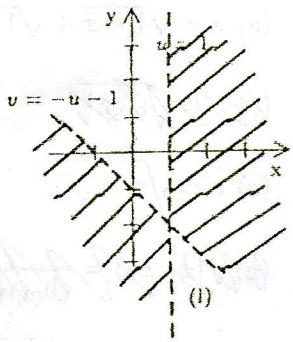
(i)



(j)



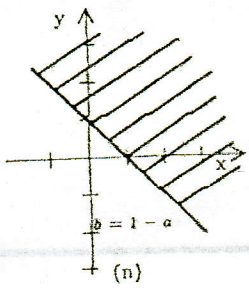
(k)



(l)

R × R

(m)



(n)

1. (a) kompaktní; (b) uzavřená; (c) kompaktní; (d) omezená; (e) kompaktní; (f) omezená; (g) omezená; (h) kompaktní; (i) omezená; (j) uzavřená; (k) kompaktní; (l) kompaktní; (m) kompaktní; (n) ani uzavřená, ani omezená, ani kompaktní