## 14.1 Ejercicios

Hacer los impares y el 32.

**13-22** Determine y grafique el dominio de la función.

**13.** $f(x, y) = \sqrt{2x - y}$

**14.** $f(x, y) = \sqrt{xy}$

**15.** $f(x, y) = \ln(9 - x^2 - 9y^2)$

**16.** $f(x, y) = \sqrt{x^2 - y^2}$

**17.** $f(x, y) = \sqrt{1 - x^2} - \sqrt{1 - y^2}$

**18.** $f(x, y) = \sqrt{y} + \sqrt{25 - x^2 - y^2}$

**19.** $f(x, y) = \dfrac{\sqrt{y - x^2}}{1 - x^2}$

**20.** $f(x, y) = \operatorname{arcsen}(x^2 + y^2 - 2)$

**21.** $f(x, y, z) = \sqrt{1 - x^2 - y^2 - z^2}$

**32.** Haga corresponder la función con su gráfica (marcadas de I a VI). Dé razones por su elección.

a) $f(x, y) = |x| + |y|$

b) $f(x, y) = |xy|$

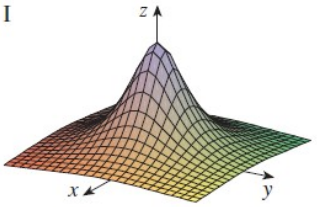
c) $f(x, y) = \dfrac{1}{1 + x^2 + y^2}$

d) $f(x, y) = (x^2 - y^2)^2$

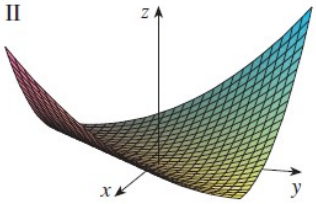
e) $f(x, y) = (x - y)^2$

f) $f(x, y) = \operatorname{sen}(|x| + |y|)$

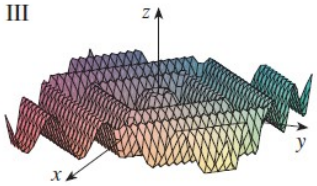
I



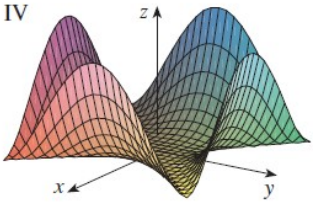

II



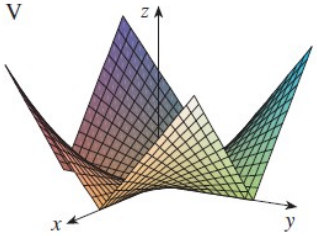

III



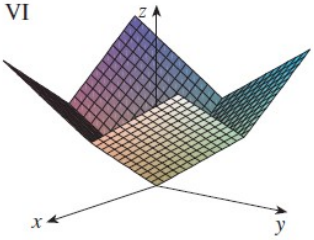

IV




V




VI




**43-50** Dibuje un mapa de contorno de la función mostrando varias curvas de nivel.

**43.** $f(x, y) = (y - 2x)^2$

**44.** $f(x, y) = x^3 - y$

**45.** $f(x, y) = \sqrt{x} + y$

**46.** $f(x, y) = \ln(x^2 + 4y^2)$

**47.** $f(x, y) = ye^x$

**48.** $f(x, y) = y \sec x$

**49.** $f(x, y) = \sqrt{y^2 - x^2}$

**50.** $f(x, y) = y/(x^2 + y^2)$

Hacer los impares.

## 14.2 Ejercicios

**5-22** Determine el límite, si existe, o demuestre que no existe.

**5.** $\lim_{(x,y)\to(1,2)} (5x^3 - x^2y^2)$

**6.** $\lim_{(x,y)\to(1,-1)} e^{-xy}\cos(x+y)$

**7.** $\lim_{(x,y)\to(2,1)} \dfrac{4-xy}{x^2+3y^2}$

**8.** $\lim_{(x,y)\to(1,0)} \ln\left(\dfrac{1+y^2}{x^2+xy}\right)$

**9.** $\lim_{(x,y)\to(0,0)} \dfrac{x^4-4y^2}{x^2+2y^2}$

**10.** $\lim_{(x,y)\to(0,0)} \dfrac{5y^4\cos^2 x}{x^4+y^4}$

**11.** $\lim_{(x,y)\to(0,0)} \dfrac{y^2\,\mathrm{sen}^2 x}{x^4+y^4}$

**13.** $\lim_{(x,y)\to(0,0)} \dfrac{xy}{\sqrt{x^2+y^2}}$

**15.** $\lim_{(x,y)\to(0,0)} \dfrac{x^2ye^y}{x^4+4y^2}$

**17.** $\lim_{(x,y)\to(0,0)} \dfrac{x^2+y^2}{\sqrt{x^2+y^2+1}-1}$

**19.** $\lim_{(x,y,z)\to(\pi,0,1/3)} e^{y^2}\tan(xz)$

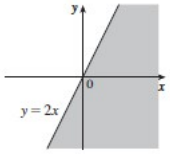
**20.** $\lim_{(x,y,z)\to(0,0,0)} \dfrac{xy+yz}{x^2+y^2+z^2}$

**21.** $\lim_{(x,y,z)\to(0,0,0)} \dfrac{xy+yz^2+xz^2}{x^2+y^2+z^4}$

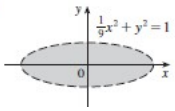
Respuestas

## 14.1

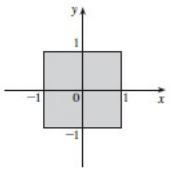
**13.** $\{(x, y) \mid y \leq 2x\}$



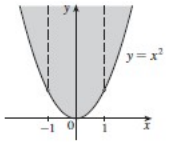

**15.** $\left\{(x, y) \mid \frac{1}{9}x^2 + y^2 < 1\right\}, (-\infty, \ln 9]$




**17.** $\{(x, y) \mid -1 \leq x \leq 1, -1 \leq y \leq 1\}$

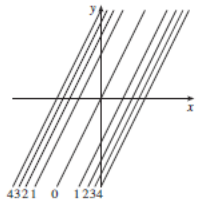



**19.** $\{(x, y) \mid y \geq x^2, x \neq \pm 1\}$

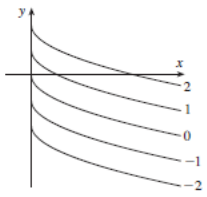



**32.**
a) VI
b) V
c) I
d) IV
e) II
f) III

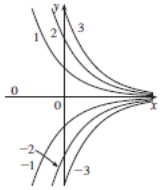
**43.** $(y - 2x)^2 = k$



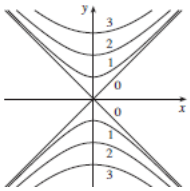

**45.** $y = -\sqrt{x} + k$



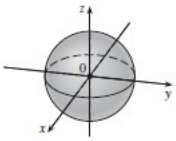

**47.** $y = ke^{-x}$




**49.** $y^2 - x^2 = k^2$




**21.** $\{(x, y, z) \mid x^2 + y^2 + z^2 \leq 1\}$




## 14.2

**5.** 1 **7.** $\frac{2}{7}$ **9.** No existe **11.** No existe
**13.** 0 **15.** No existe **17.** 2
**19.** $\sqrt{3}$ **21.** No existe