

## 14.10 Problemas

Localice y clasifique los puntos críticos de las funciones en los problemas 1 a 22.

1.  $f(x, y) = 2x^2 + y^2 + 4x - 4y + 5$

2.  $f(x, y) = 10 + 12x - 12y - 3x^2 - 2y^2$

3.  $f(x, y) = 2x^2 - 3y^2 + 2x - 3y + 7$   
(Fig. 14.10.11)

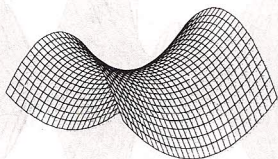


Figura 14.10.11 Gráfica del problema 3

4.  $f(x, y) = xy + 3x - 2y + 4$

5.  $f(x, y) = 2x^2 + 2xy + y^2 + 4x - 2y + 1$

6.  $f(x, y) = x^2 + 4xy + 2y^2 + 4x - 8y + 3$

7.  $f(x, y) = x^3 + y^3 + 3xy + 3$  (Fig. 14.10.12)

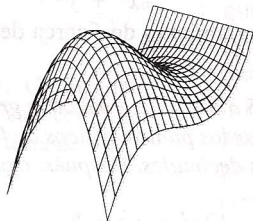


Figura 14.10.12 Gráfica del problema 7

8.  $f(x, y) = x^2 - 2xy + y^3 - y$

9.  $f(x, y) = 6x - x^3 - y^3$

10.  $f(x, y) = 3xy - x^3 - y^3$

11.  $f(x, y) = x^4 + y^4 - 4xy$

12.  $f(x, y) = x^3 + 6xy + 3y^2$

13.  $f(x, y) = x^3 + 6xy + 3y^2 - 9x$

14.  $f(x, y) = x^3 + 6xy + 3y^2 + 6x$

15.  $f(x, y) = 3x^2 + 6xy + 2y^3 + 12x - 24y$   
(Fig. 14.10.13)

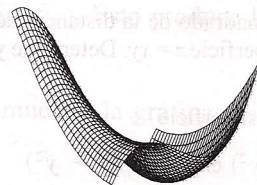


Figura 14.10.13 Gráfica del problema 15

16.  $f(x, y) = 3x^2 + 12xy + 2y^3 - 6x + 6y$

17.  $f(x, y) = 4xy - 2x^4 - y^2$

18.  $f(x, y) = 8xy - 2x^2 - y^4$

19.  $f(x, y) = 2x^3 - 3x^2 + y^2 - 12x + 10$   
(Fig. 14.10.14)

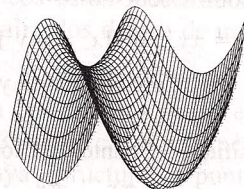


Figura 14.10.14 Gráfica del problema 19