

14.3

Partial solutions for 15-22 47 48 53 54

15. $f_x(x, y) = 4x^3 + 5y^3, f_y(x, y) = 15xy^2$

16. $f_x(x, y) = 2xy, f_y(x, y) = x^2 - 12y^3$

17. $f_x(x, t) = -t^2 e^{-x}, f_t(x, t) = 2te^{-x}$

18. $f_x(x, t) = \frac{3}{2\sqrt{3x+4t}}, f_t(x, t) = \frac{2}{\sqrt{3x+4t}}$

19. $\frac{\partial z}{\partial x} = \frac{1}{x+t^2}, \frac{\partial z}{\partial t} = \frac{2t}{x+t^2}$

20. $\frac{\partial z}{\partial x} = xy \cos(xy) + \sin(xy), \frac{\partial z}{\partial y} = x^2 \cos(xy)$

21. $f_x(x, y) = 1/y, f_y(x, y) = -x/y^2$

22. $f_x(x, y) = \frac{y-x}{(x+y)^3}, f_y(x, y) = -\frac{2x}{(x+y)^3}$

47. $\frac{\partial z}{\partial x} = \frac{-x}{3z}, \frac{\partial z}{\partial y} = -\frac{2y}{3z}$

48. $\frac{\partial z}{\partial x} = \frac{x}{1-z}, \frac{\partial z}{\partial y} = \frac{y}{z-1}$

53. $f_x(x, y) = 4x^3y - 6x^2y^2, f_y(x, y) = x^4 - 4x^3y, f_{xx}(x, y) = 12x^2y - 12xy^2, f_{yy}(x, y) = -4x^3, f_{xy}(x, y) = f_{yx}(x, y) = 4x^3 - 12x^2y$

54. $f_{xx}(x, y) = -\frac{a^2}{(ax+by)^2}, f_{yy} = -\frac{b^2}{(ax+by)^2}, f_{xy}(x, y) = f_{yx}(x, y) = -\frac{ab}{(ax+by)^2}$