

1) Determine whether z is a function of x and y .

a) $x^2z + 3y^2 - xy = 10$

b) $\frac{x^2}{4} + \frac{y^2}{9} + z^2 = 1$

2) Given $g(x, y) = \ln|x + y|$, find and simplify the functions values.

a) $(1, 0)$

c) $(0, e)$

e) $(e, e/2)$

b) $(0, -1)$

d) $(1, 1)$

f) $(2, 5)$

3) Given $f(x, y, z) = \sqrt{x + y + z}$, find and simplify the functions values.

a) $(0, 5, 4)$

b) $(6, 8, -3)$

4) Given $g(x, y) = \int_x^y (2t - 3) dt$, find and simplify the functions values.

a) $(4, 0)$

b) $(4, 1)$

5) Given $f(x, y) = 2x + y^2$, find and simplify the functions values.

a)
$$\frac{f(x + \Delta x, y) - f(x, y)}{\Delta x}$$

b)
$$\frac{f(x, y + \Delta y) - f(x, y)}{\Delta y}$$

6) Describe the domain and range of the function.

a) $f(x, y) = x^2 + y^2$

b) $f(x, y) = e^{-xy}$

c) $g(x, y) = \frac{y}{\sqrt{x}}$

d) $z = \frac{xy}{x - y}$

e) $f(x, y) = \sqrt{4 - x^2 - y^2}$

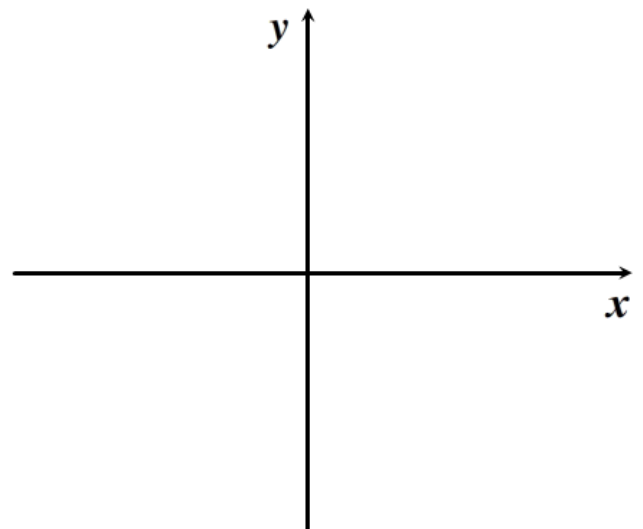
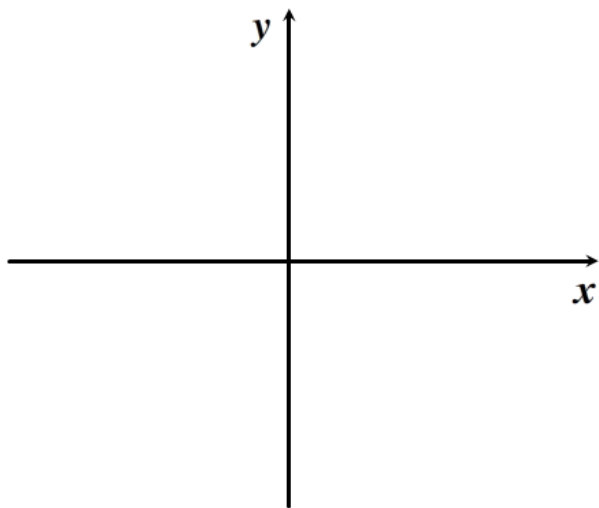
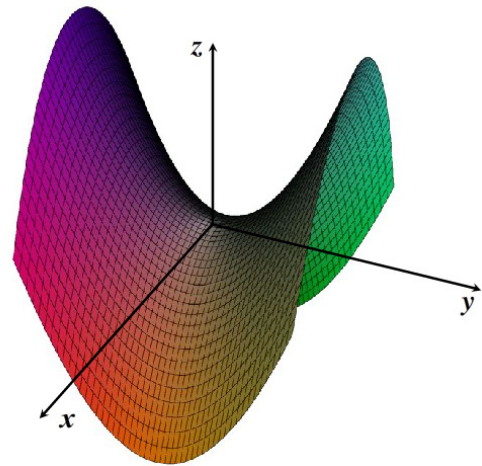
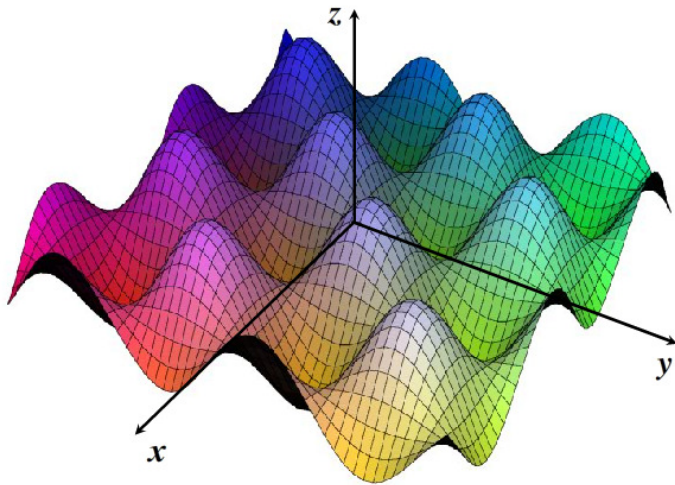
f) $f(x, y) = \ln(4 - x - y)$

7) Find the domain of the function.

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

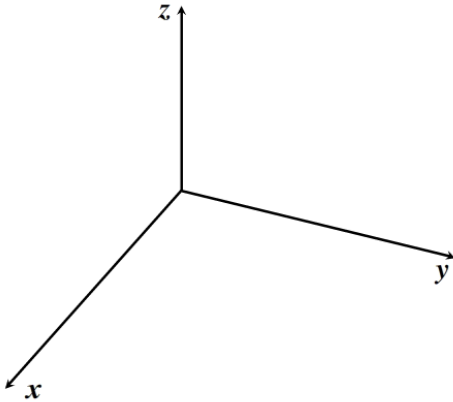
b) $f(x, y, z) = \ln(16 - 4x^2 - 4y^2 - z^2)$

8) Make a rough sketch of a contour map for the functions whose graph are shown.

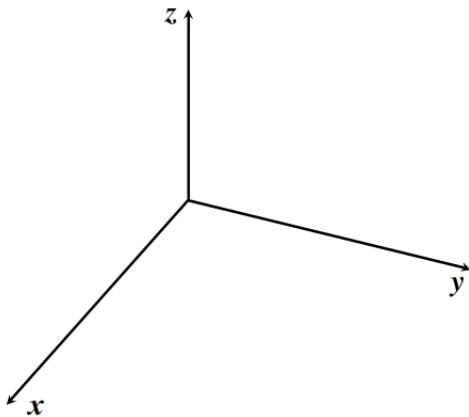


9) Sketch the level surface of the function for the given value of k . Also, classify the surface for each given k -value.

a) $f(x, y, z) = x^2 + y^2 + z^2, k = 9$



b) $f(x, y, z) = x^2 + \frac{1}{4}y^2 - z, k = 1$



c) $f(x, y, z) = 4x^2 + 4y^2 - z^2, k = 0$

