

Extra practice with graphing functions of two variables

1. Describe in words, and sketch, the graph of each function.

(a) $f(x, y) = 4$.

(b) $f(x, y) = -3$.

(c) $f(x, y) = 0$

(d) $f(x, y) = x$

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(e) $f(x, y) = x + 4$

(f) $f(x, y) = y/2$

(g) $f(x, y) = x + y - 1$

(h) $f(x, y) = -2x + y + 6$

2. Describe in words, and sketch, the graph of each equation in \mathbb{R}^3 .

(a) $x = 2$

(b) $x = 0$

(c) $y = -4$

(d) $y = 0$

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(e) $y = x$

(f) $y = x^2$

(g) $x^2 + y^2 = 1$

(h) $z = x^2$

3. Draw the contour diagram of each function by sketching contour curves for the values $c = -2, 0, 2, 4$, and 6 .

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

(b) $f(x, y) = x - 6y$

(c) $f(x, y) = 2x - y - 4$

(d) Functions in (a)-(c) are linear. What can you say about their contour diagrams?

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4. Draw the contour diagram of each function by sketching three to four contour curves.

(a) $z = x^2$

(b) $z = 3 - x^2$

(c) $z = x^2y$

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(d) $f(x, y) = x^2y^{-1}$

(e) $z = \ln y$

(f) $f(x, y) = ye^x$

(g) $z = \ln(x^2 + y^2)$

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

(i) $f(x, y) = \tan x$