

1.

$$f(x, y) = \frac{1}{2}x^{2/3}y^{1/3}$$

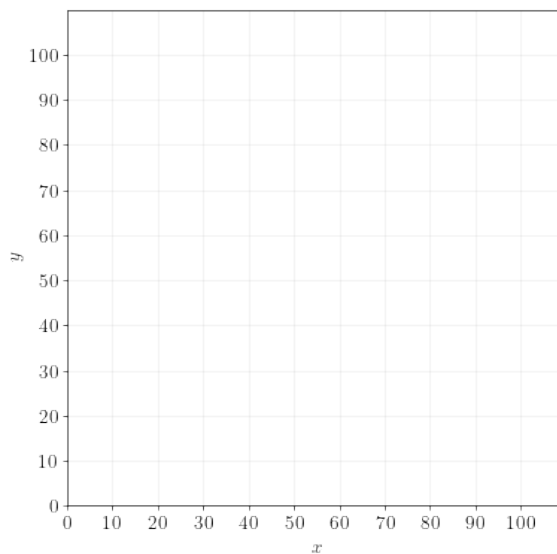
Write down an equation describing the contour line for $f(x, y) = z$.

2.

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

a. Write down an equation describing the contour line for $f(x, y) = z$.

b. Using the grid below, draw the contour lines for levels $z = 20, 40, 60, 80, 100$.



3.

$$f(x, y) = x^{3/4}y^{1/4}$$

Write down the partial derivatives of $f(x, y)$ with respect to x and y .

4.

$$f(x, y) = 8x - x^2 + 12y - y^3$$

- a. Write down the first order conditions.
 - b. Find the choice of x and y that maximizes $f(x, y)$.
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5. Consider the optimization problem:

$$\max_{x,y} xy \text{ s.t. } 4x + 3y = 42$$

- a. Write down the two first order conditions.
 - b. Find the values of x and y which solve the problem.
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6. Consider the optimization problem:

$$\max_{x,y} x^{3/4}y^{1/4} \text{ s.t. } 2x + 3y = 72$$

- a. Write down the two first order conditions.
 - b. Find the values of x and y which solve the problem.
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