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Linearização

$$z = xy \quad 5 \leq x \leq 7 \quad 10 \leq y \leq 12$$

$$\bar{x} = 6 \quad \bar{y} = 11 \quad x = 5 \quad y = 10$$

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

$$f(x, y) = f(\bar{x}, \bar{y}) + \frac{\partial f}{\partial x} \bigg|_{\bar{x}} (x - \bar{x}) + \frac{\partial f}{\partial y} \bigg|_{\bar{y}} (y - \bar{y}) + \dots$$

$$\Rightarrow f(x, y) = \bar{x}\bar{y} + y(x - \bar{x}) + x(y - \bar{y}) \Rightarrow$$

$$\Rightarrow f(x, y) = 6(11) + y(x - 6) + x(y - 11) \Rightarrow$$

$$\Rightarrow f(x, y) = 66 + xy - 6y + xy - 11x \Rightarrow$$

$$\Rightarrow f(x, y) = -11x - 6y + 2xy + 66$$

$$z = -11x - 6y + 2xy + 66$$

$$E(x, y) = xy - (-11x - 6y + 2xy + 66) \Rightarrow$$

$$\Rightarrow E(x, y) = 11x + 6y - xy + 66$$

$$E(5, 10) = 11(5) + 6(10) - 5(10) + 66 \Rightarrow$$

$$\Rightarrow E(5, 10) = 55 + 60 - 50 + 66 \Rightarrow E(5, 10) = 1$$