1. Напишите конечно-разностные соотношения «назад», «вперед» и центральное для следующих производных:

$$\left.\frac{\partial f}{\partial x}\right|_{i,j} = \frac{f_{i,j} - f_{i-1,j}}{\Delta x}$$

$$\left.\frac{\partial f}{\partial y}\right|_{i,j} = \frac{f_{i,j} - f_{i,j-1}}{\Delta y}$$

$$\left.\frac{\partial f}{\partial x}\right|_{i,j} = \frac{f_{i+1,j} - f_{i,j}}{\Delta x}$$

$$\left.\frac{\partial f}{\partial y}\right|_{i,j} = \frac{f_{i,j+1} - f_{i,j}}{\Delta y}$$

$$\left.\frac{\partial f}{\partial x}\right|_{i,j} = \frac{f_{i+1,j} - f_{i-1,j}}{2\Delta x}$$

$$\left.\frac{\partial f}{\partial y}\right|_{i,j} = \frac{f_{i,j+1} - f_{i,j-1}}{2\Delta y}$$

$$\left.\frac{\partial^2 f}{\partial x^2}\right|_{i,j} = \frac{f_{i+1,j} + f_{i-1,j} - 2f_{i,j}}{\Delta x^2}$$

$$\left.\frac{\partial^2 f}{\partial y^2}\right|_{i,j} = \frac{f_{i,j+1} + f_{i,j-1} - 2f_{i,j}}{\Delta y^2}$$