**Algorithm 1** Mandelbrot set

**Require:** $c_x, c_y, \Sigma_{\max} \in \mathbb{R}, \quad i \in \mathbb{N}, \quad i_{\max} > 0, \quad \Sigma_{\max} > 0$

**function** MANDELBROT$(c_x, c_y, i_{\max}, \Sigma_{\max})$
    **local variables:** $x, y, x_1, y_1, i, \Sigma$
    $x, y, i, \Sigma \leftarrow 0$ ▷ initial zero value for variables
    **while** $\Sigma \leq \Sigma_{\max}$ and $i < i_{\max}$ **do**
        $x_1 \leftarrow x^2 - y^2 + c_x$
        $y_1 \leftarrow 2xy + c_y$
        $x \leftarrow x_1$
        $y \leftarrow y_1$
        $\Sigma \leftarrow x^2 + y^2$
    **end while**
    **if** $i < i_{\max}$ **then**
        **return** $i$
    **end if**
    **return** $0$
**end function**