Your function can be plotted symmetrically in the coordinate system defined by the principal axes of the ellipse. Your function is minimized at $x = x_0 = 19/10$ and $y = y_0 = 9/5$ with $f(x_0, y_0) = -10.1 =: z_0$. So the first step is a translation

$$x' = x - x_0\,, \quad y' = y - y_0 \quad \text{and} \quad z' = z - z_0\,.$$

The second step is to rotate to the principal axes, which can be achieved by diagronalizing the Hesse matrix of $f$,

$$H = \begin{pmatrix} 4 & -2 \\ -2 & 6 \end{pmatrix}\,.$$

This yields a rotation angle of 31.8°. The perhaps simplest way to produce the figure is thus to plot the function in the principal axes system and draw the unrotated axes by hand.