

13.1.9 An arccosine is real exactly when its argument is between ± 1 :

$$\begin{aligned} -1 &\leq y - x^2 \leq 1; \\ x^2 - 1 &\leq y \leq x^2 + 1. \end{aligned}$$

Formally,

$$\text{dom } f = \{x, y \mid x^2 - 1 \leq y \leq x^2 + 1\}.$$

Here is a sketch, created by Wolfram Alpha:

