

$$\begin{aligned}\lim_{(x,y)\rightarrow(0,0)} \frac{x^2 + y^2}{\sqrt{x^2 + y^2 + 16} - 4} &= \lim_{(x,y)\rightarrow(0,0)} \frac{x^2 + y^2}{\sqrt{x^2 + y^2 + 16} - 4} \cdot \frac{\sqrt{x^2 + y^2 + 16} + 4}{\sqrt{x^2 + y^2 + 16} + 4} \\ &= \lim_{(x,y)\rightarrow(0,0)} \frac{(x^2 + y^2)(\sqrt{x^2 + y^2 + 16} + 4)}{x^2 + y^2} \\ &= \lim_{(x,y)\rightarrow(0,0)} (\sqrt{x^2 + y^2 + 16} + 4) = 8\end{aligned}$$