

16) $\lim_{(x,y) \rightarrow (0,0)} \frac{x^2}{(x^2+y^2)^{3/2}}$ 是否成立.

答: 極座標表示: $x = r \cos \theta$, $y = r \sin \theta$.

$$\frac{x^2}{(x^2+y^2)^{3/2}} = \frac{r^2 \cos^2 \theta}{(r^2)^{3/2}} = \frac{r^2 \cos^2 \theta}{r^3} = \frac{\cos^2 \theta}{r}$$

若 $\theta = \frac{\pi}{4}$ 則 $r \rightarrow 0$ 則 $\frac{\cos^2 \theta}{r} \rightarrow \infty$. 故

極限值 = L.