

[illegible]

$$z = (x^2 + y^2 - 2(x^2 - y^2))^2 \quad \text{at } (0,0) \quad \text{is not a local extremum}$$

$$\left. \begin{aligned} 0 &= (1 + \tau h + \tau x) h + = \\ h + + h \tau \cdot (\tau h + \tau x) \tau &= h \tau \\ 0 &= (1 - \tau h + \tau x) x + = \\ x + - x \tau \cdot (\tau h + \tau x) \tau &= x \tau \end{aligned} \right\}$$

$$\begin{aligned} (0, 1) \cap (0, 0) &= (h, x) \Leftrightarrow \\ (0 = h) \wedge (1 = x) &\text{ or } (0 = h = x) \Leftrightarrow \\ 0 = h \wedge (1 = x) \text{ or } 0 = x &\Leftrightarrow \end{aligned}$$

$$\begin{aligned} z^2 x^2 &= 4(x^2 + y^2 - 1) + 4x \cdot 2x \\ &= 12x^2 + 4y^2 - 4 \\ &= 4(3x^2 + y^2 - 1) \end{aligned}$$

$$z_1 z_2 = 4(x^2 + y^2 + 1) + 4y \cdot 2y = 4(x^2 + y^2 + 1) + 8y^2 = 4(x^2 + 3y^2 + 1)$$

$$(1) \quad (0,0) = \phi^{-1}(0,0) = \begin{vmatrix} z & x \\ z & x \end{vmatrix} = \begin{vmatrix} 0 & 4 \\ 0 & 4 \end{vmatrix} = -16 < 0$$

0.5 212 702 722 702 1.2 212 1.1

(ii) $(\pm 1, 0)$ における

$$\begin{vmatrix} z_{xx} & z_{xy} \\ z_{yx} & z_{yy} \end{vmatrix} = \begin{vmatrix} 4 \cdot 2 & 0 \\ 0 & 4 \cdot 2 \end{vmatrix} = 64 > 0$$

$$z_{xx} = 4 \cdot 2 > 0$$

から z は ± 1 における極値をとる。