

(証明 v)

(d.4.7)(d.4.31)より

$$1.56 \cdot 2.9 < OE_1 \cdot OI_3 < 1.57 \cdot 2.92 \quad \cdots(d.5.1)$$

(d.5.1)より

$$4.524 < OE_1 \cdot OI_3 < 4.5844 \quad \cdots(d.5.2)$$

(d.5.2)より

$$4.52 < OE_1 \cdot OI_3 < 4.59 \quad \cdots(d.5.3)$$

(d.4.7)(d.5.3)より

$$4.52 + 1.56 - 2 < OE_1 \cdot OI_3 + OE_1 - 2 < 4.59 + 1.57 - 2 \quad \cdots(d.5.4)$$

(d.5.4)より

$$4.08 < OE_1 \cdot OI_3 + OE_1 - 2 < 4.16 \quad \cdots(d.5.5)$$

(d.5.5)より

$$OE_1 \cdot OI_3 + OE_1 - 2 > 0 \quad \cdots(d.5.6)$$

(d.4.7)(d.4.34)より

$$1.56 \cdot 0.33 < OE_1 \cdot OI_4 < 1.57 \cdot 0.35 \quad \cdots(d.5.7)$$

(d.5.7)より

$$0.5148 < OE_1 \cdot OI_4 < 0.5495 \quad \cdots(d.5.8)$$

(d.5.8)より

$$0.51 < OE_1 \cdot OI_4 < 0.55 \quad \cdots(d.5.9)$$

(d.4.7)(d.5.9)より

$$0.51 - 1.57 + 2 < OE_1 \cdot OI_4 - OE_1 + 2 < 0.55 - 1.56 + 2 \quad \cdots(d.5.10)$$

(d.5.10)より

$$0.94 < OE_1 \cdot OI_4 - OE_1 + 2 < 0.99 \quad \cdots(d.5.11)$$

(d.5.11)より

$$OE_1 \cdot OI_4 - OE_1 + 2 > 0 \quad \cdots(d.5.12)$$

$OE_2 > 0$ 、 $OI_2 > 0$ より

$$OE_2 \cdot OI_2 + OE_2 + 2 > 0 \quad \cdots(d.5.13)$$

(d.4.10)(d.4.19)より

$$2.56 \cdot 2.04 < OE_2 \cdot OI_1 < 2.57 \cdot 2.06 \quad \cdots(d.5.14)$$

(d.5.14)より

$$5.2224 < OE_2 \cdot OI_1 < 5.2942 \quad \cdots(d.5.15)$$

(d.5.15)より

$$5.22 < OE_2 \cdot OI_1 < 5.3 \quad \cdots(d.5.16)$$

(d.4.10)(d.5.16)より

$$5.22 - 2.57 - 2 < OE_2 \cdot OI_1 - OE_2 - 2 < 5.3 - 2.56 - 2 \quad \cdots(d.5.17)$$

(d.5.17)より

$$0.65 < OE_2 \cdot OI_1 - OE_2 - 2 < 0.74 \quad \cdots(d.5.18)$$

(d.5.18)より

$$OE_2 \cdot OI_1 - OE_2 - 2 > 0 \quad \cdots(d.5.19)$$

(d.4.46)より

$$1.85^2 - 2 < OM_1^2 - 2 < 1.89^2 - 2 \quad \cdots(d.5.20)$$

(d.5.20)より

$$1.4225 < OM_1^2 - 2 < 1.5721 \quad \cdots(d.5.21)$$

(d.5.21)より

$$1.42 < OM_1^2 - 2 < 1.58 \quad \cdots(d.5.22)$$

(d.5.22)より

$$OM_1^2 - 2 > 0 \quad \cdots(d.5.23)$$

(d.4.49)より

$$2 - 0.2^2 < 2 - OM_2^2 < 2 - 0.16^2 \quad \cdots(d.5.24)$$

(d.5.24)より

$$1.96 < 2 - OM_2^2 < 1.9744 \quad \cdots(d.5.25)$$

(d.5.25)より

$$1.96 < 2 - OM_2^2 < 1.98 \quad \cdots(d.5.26)$$

(d.5.26)より

$$2 - OM_2^2 > 0 \quad \cdots(d.5.27)$$

(d.4.59)より

$$1.46^2 - 2 < OM_3^2 - 2 < 1.49^2 - 2 \quad \cdots(d.5.28)$$

(d.5.28)より

$$0.1316 < OM_3^2 - 2 < 0.2201 \quad \cdots(d.5.29)$$

(d.5.29)より

$$0.13 < OM_3^2 - 2 < 0.23 \quad \cdots(d.5.30)$$

(d.5.30)より

$$OM_3^2 - 2 > 0 \quad \cdots(d.5.31)$$

(d.4.62)より

$$1.95^2 - 2 < OM_4^2 - 2 < 1.98^2 - 2 \quad \cdots(d.5.32)$$

(d.5.32)より

$$1.8025 < OM_4^2 - 2 < 1.9204 \quad \cdots(d.5.33)$$

(d.5.33)より

$$1.8 < OM_4^2 - 2 < 1.93 \quad \cdots(d.5.34)$$

(d.5.34)より

$$OM_4^2 - 2 > 0 \quad \cdots(d.5.35)$$

(d.4.46)(d.5.30)より

$$OM_3^2 - 2 < OM_1 \quad \cdots(d.5.36)$$

(d.4.49)(d.4.34)より

$$OM_2 < OM_4^2 - 1 \quad \cdots(d.5.37)$$