$$\therefore \quad r = \frac{\lambda}{1+e\cos\theta} \qquad (1.24)$$

$$(x, y) = (r\cos\theta, r\sin\theta) = \left(\frac{\lambda\cos\theta}{1+e\cos\theta}, \frac{\lambda\sin\theta}{1+e\cos\theta}\right).$$

$$\frac{(1-e^2)^2}{\lambda^2}\left(\frac{\lambda\cos\theta}{1+e\cos\theta} + \frac{\lambda e}{1-e^2}\right)^2 + \frac{1-e^2}{\lambda^2}\frac{\lambda^2\sin^2\theta}{(1+e\cos\theta)^2} = 1$$

$$(1-e^2)^2\left(\frac{\lambda^2\cos^2\theta}{(1+e\cos\theta)^2} + 2\frac{\lambda^2 e\cos\theta}{(1+e\cos\theta)(1-e^2)} + \frac{\lambda^2 e^2}{(1-e^2)^2}\right) + (1-e^2)\frac{\lambda^2\sin^2\theta}{(1+e\cos\theta)^2} = \lambda^2$$

$$\frac{(1-e^2)^2\lambda^2\cos^2\theta}{(1+e\cos\theta)^2} + \frac{2\lambda^2 e\cos\theta}{1+e\cos\theta} + \frac{\lambda^2 e^2}{1-e^2} + \frac{\lambda^2\sin^2\theta}{(1+e\cos\theta)^2} = \frac{\lambda^2}{1-e^2}$$

$$\frac{\lambda^2 - e^2\lambda^2\cos^2\theta + 2\lambda^2 e\cos\theta(1+e\cos\theta)}{(1+e\cos\theta)^2} = \lambda^2$$

$$\frac{\lambda^2(1+2e\cos\theta+e^2\cos^2\theta)}{(1+e\cos\theta)^2} = \lambda^2$$

$$\frac{(1-e^2)^2}{\lambda^2}\left(x + \frac{\lambda e}{1-e^2}\right)^2 + \frac{1-e^2}{\lambda^2}y^2 = 1.$$ 楕円.

$$C = \sqrt{\frac{\lambda^2}{(1-e^2)^2} - \frac{\lambda^2}{1-e^2}} = \sqrt{\frac{\lambda^2(1-1+e^2)}{(1-e^2)^2}} = \sqrt{\frac{\lambda^2 e^2}{(1-e^2)^2}} = \frac{\lambda e}{1-e^2}$$

$\therefore$ O は楕円の焦点。 $\qquad C = \sqrt{a^2-b^2}$

(後述2) $\Rightarrow$ $H_0 = 0$ の場合

$(1.20) \Rightarrow (1.21)$, $e = 1$

$$(1.24)' \quad r = \frac{\lambda}{1+\cos\theta}$$

$$= \frac{\lambda}{1+\frac{x}{r}}$$

$$\Rightarrow r + x = \lambda \quad \Rightarrow r = \lambda - x$$

$$\Rightarrow r^2 = \lambda^2 - 2x\lambda + x^2$$

$$\Rightarrow x^2 + y^2 = \lambda^2 - 2x\lambda + x^2$$

$$\Rightarrow y^2 = \lambda^2 - 2x\lambda$$ 放物線 □