

$$(1) \quad \sec x + \tan y \frac{dy}{dx} = 0$$

$$\tan y \frac{dy}{dx} = - \sec x$$

$$\tan y \, dy = - \sec x \, dx$$

$$\int \tan y \, dy = - \int \sec x \, dx$$

$$- \operatorname{Ln} \cos y = - \operatorname{Ln} |\sec x + \tan x| + \operatorname{Ln} c$$

$$\operatorname{Ln} |\sec x + \tan x| - \operatorname{Ln} \cos y = \operatorname{Ln} c$$

$$\Rightarrow \operatorname{Ln} \frac{\sec x + \tan x}{\cos y} = \operatorname{Ln} c$$

$$\Rightarrow \frac{\sec x + \tan x}{\cos y} = c$$

$$\Rightarrow \sec y [\sec x + \tan x] = c$$

$$g) \quad \frac{1}{r} \frac{dr}{d\theta} = \cot \theta$$

$$\frac{1}{r} \, dr = \cot \theta \, d\theta$$

$$\int \frac{1}{r} \, dr = \int \cot \theta \, d\theta$$

$$\Rightarrow \operatorname{Ln} r = \operatorname{Ln} (\sin \theta) + \operatorname{Ln} c$$

$$\Rightarrow \operatorname{Ln} \left(\frac{r}{\sin \theta} \right) = \operatorname{Ln} c$$

$$\Rightarrow \frac{r}{\sin \theta} = c \quad \Rightarrow \quad r = c \sin \theta$$

الحل: