

$$6) \lim_{x \rightarrow 0} \frac{\ln(\sin 2x)}{\ln(\sin x)} \rightarrow \text{L'Hopital}$$

$$\frac{2 \cos(2x)}{\cos(x)}$$

$$2 \frac{\cos 2x}{\sin 2x} \cdot \frac{\cos x}{\sin x}$$

$$\frac{2 \cos 2x}{2 \sin x \cos x} \cdot \frac{\cos x}{\sin x}$$

$$\frac{2 \cos 2x \sin x}{2 \sin x \cos^2 x} \cdot \frac{\cos 2x}{\cos^2 x}$$

$$\frac{\cos 2(0)}{\cos(0) \cdot \cos(0)}$$

$$= 1 //$$

$$\frac{d}{dx} \ln(\sin(2x))$$

$$\frac{d}{dy} \ln(u) \cdot \frac{d}{dx} \sin(2x)$$

$$\frac{1}{u} \cdot \frac{d}{dy} \sin(u) \cdot \frac{d}{dx} 2x$$

$$\frac{1}{\sin(2x)} \cdot \cos(u) \cdot 2$$

$$= \frac{2 \cos(2x)}{\sin(2x)}$$

$$\frac{d}{dy} \ln(u) \cdot \frac{d}{dx} \sin x$$

$$\frac{1}{u} \cdot \cos x$$

$$\frac{1}{\sin x} \cdot \cos x$$