① $y = \sin 5x \Rightarrow y' = \cos 5x \cdot 5 \Rightarrow y' = 5\cos 5x$ مثلي

② $y = \cos(3x+1) \Rightarrow y' = -\sin(3x+1)(3) \Rightarrow y' = -3\sin(3x+1)$

③ $y = \tan 2x \Rightarrow y' = \sec^2 2x \cdot 2 \Rightarrow y' = 2\sec^2 2x$

④ $y = \sec 3x \Rightarrow y' = \sec 3x \cdot \tan 3x \cdot 3 \Rightarrow y' = 3\sec 3x \cdot \tan 3x$

⑤ $y = \cot x \Rightarrow y' = -\csc^2 x$

⑥ $y = \csc x \Rightarrow y' = -\csc x \cdot \cot x$

⑦ $y = 2\sin 3x \Rightarrow y' = 2\cos 3x \cdot 3 \Rightarrow y' = 6\cos 3x$

⑧ $y = 3\cos 2x \Rightarrow y' = -3\sin 2x \cdot 2 \Rightarrow y' = -6\sin 2x$

⑨ $y = x\sin x \Rightarrow y' = x \cdot \cos x + \sin x \cdot 1$

$= x\cos x + \sin x$

⑩ $y = \sin^2 x \Rightarrow y = (\sin x)^2 \Rightarrow y' = 2(\sin x)(\cos x)$

مثال: أوجد y^{IV} إذا كان $y = \cos 2x$ حيث y^{IV} هي المشتقة الرابعة.

$$y = \cos 2x \Rightarrow y' = -\sin 2x \cdot 2 \Rightarrow y' = -2\sin 2x$$

$$y'' = -2\cos 2x \cdot 2 \Rightarrow y'' = -4\cos 2x$$

$$y''' = +4\sin 2x \cdot 2 \Rightarrow y''' = 8\sin 2x$$

$$y'''' = 8\cos 2x \cdot 2 \Rightarrow y'''' = 16\cos 2x$$

مثال: أوجد $f'''(1)$ إذا كان $f(x) = \sin \pi x$ حيث f''' هي المشتقة الثالثة.

$$f(x) = \sin \pi x \Rightarrow f'(x) = \cos \pi x \cdot \pi \Rightarrow f'(x) = \pi \cos \pi x$$

$$f''(x) = -\pi \sin \pi x \cdot \pi \Rightarrow f''(x) = -\pi^2 \sin \pi x$$

$$f'''(x) = -\pi^2 \cos \pi x \cdot \pi \Rightarrow f'''(x) = -\pi^3 \cos \pi x$$

$$f'''(1) = -\pi^3 \cos \pi (1) \Rightarrow f'''(1) = -\pi^3 \cos \pi$$