BÀI TẬP GIÁO KHOA

Thầy giáo : Nguyễn Quốc Tùng

Bài 1

$y = \sin x + 5\cos x - \tan x$

$y' = (\sin x)' + 5(\cos x)' - (\tan x)'$

$y' = \cos x - 5\sin x - \dfrac{1}{\cos^2 x}$

Bài 2

$y = \sin(3x - \dfrac{\pi}{4})$

$y' = (3x - \dfrac{\pi}{4})' \cdot \cos(3x - \dfrac{\pi}{4})$

$y' = 3\cos(3x - \dfrac{\pi}{4})$

Bài 3

$y = \cos^2(2x)$

$y' = 2\cos(2x) \cdot (\cos 2x)'$

$y' = 2\cos(2x) \cdot [-(2x)' \cdot \sin 2x]$

$y' = -4\cos 2x \sin 2x = -2\sin 4x$

Bài 4

$y = \tan\sqrt{x^2 + 1}$

$y' = \dfrac{(\sqrt{x^2 + 1})'}{\cos^2\sqrt{x^2 + 1}}$

$y' = \dfrac{\dfrac{x}{\sqrt{x^2 + 1}}}{\cos^2\sqrt{x^2 + 1}}$

$y' = \dfrac{x}{\sqrt{x^2 + 1} \cdot \cos^2\sqrt{x^2 + 1}}$

Bài 5

$y = x^2 \cdot \sin x$

$y' = (x^2)' \sin x + x^2 (\sin x)'$

$y' = 2x \sin x + x^2 \cos x$

Bài 6

$y = \dfrac{\cos x}{1 - \sin x}$

$y' = \dfrac{(\cos x)'(1 - \sin x) - \cos x (1 - \sin x)'}{(1 - \sin x)^2}$

$y' = \dfrac{-\sin x (1 - \sin x) - \cos x (-\cos x)}{(1 - \sin x)^2}$

$y' = \dfrac{-\sin x + \sin^2 x + \cos^2 x}{(1 - \sin x)^2} = \dfrac{1 - \sin x}{(1 - \sin x)^2} = \dfrac{1}{1 - \sin x}$

Bài 7

$y = \cot(x^3 - 2x)$

$y' = -(x^3 - 2x)' \cdot [1 + \cot^2 (x^3 - 2x)]$

$y' = -(3x^2 - 2) \cdot [1 + \cot^2 (x^3 - 2x)]$

$y' = \dfrac{2 - 3x^2}{\sin^2 (x^3 - 2x)}$

Bài 8

$y = \sqrt{1 + 2 \tan x}$

$y' = \dfrac{(1 + 2 \tan x)'}{2\sqrt{1 + 2 \tan x}}$

$y' = \dfrac{\dfrac{2}{\cos^2 x}}{2\sqrt{1 + 2 \tan x}}$

$y' = \dfrac{1}{\cos^2 x \cdot \sqrt{1 + 2 \tan x}}$

Bài 9

$f(x) = \cos x + \sin x + x$

$f'(x) = -\sin x + \cos x + 1$

$f'(x) = 0 \Leftrightarrow \cos x - \sin x = -1 \Leftrightarrow \sqrt{2}\cos(x + \frac{\pi}{4}) = -1$

$\cos(x + \frac{\pi}{4}) = -\frac{\sqrt{2}}{2} \Leftrightarrow x + \frac{\pi}{4} = \pm\frac{3\pi}{4} + k2\pi$

$x = \frac{\pi}{2} + k2\pi$ hoặc $x = -\pi + k2\pi$ ($k \in \square$)

Bài 10

$y = (\sin^2 x + \cos^2 x)(\sin^4 x - \sin^2 x\cos^2 x + \cos^4 x) + 3\sin^2 x\cos^2 x$

$y = (\sin^2 x + \cos^2 x)^2 - 3\sin^2 x\cos^2 x + 3\sin^2 x\cos^2 x$

$y = 1^2 = 1$

$y' = (1)' = 0$ (đpcm)