MULTIPLE CHOICE: Non-Calculator

1. Suppose $g(x) = 2\sin x - 3\cos x$. Then $g'(x) = ?$

$g'(x) = 2\cos x - 3(-\sin x)$
$= 2\cos x + 3\sin x$

A. $2\sin x + 3\cos x$

B. $2\cos x - 3\sin x$

C. $2\cos x + 3\sin x$

D. $-2\cos x + 3\sin x$

E. $-2\cos x - 3\sin x$

2. Let $f(x) = 2\sin x$. Then $\frac{d}{dx}(f'(x)) = \frac{d}{dx}(2\cos x)$

2nd derivative

$= 2(-\sin x)$
$= -2\sin x$

A. $2\cos x$

B. $2\sin x$

C. $-2\cos x$

D. $-2\sin x$

E. None of the above

3. Suppose $v(t) = \underbrace{3t^3}_{f}\underbrace{\cos t}_{g}$. Then $v'(t) = (\cos t)(9t^2) + 3t^3(-\sin t)$

product rule $gf' + fg'$

$= 9t^2\cos t - 3t^3\sin t$

A. $-9t^2\sin t$

B. $9t^2\sin t$

C. $9t^2\cos t - 3t^3\sin t$

D. $9t^2\cos t + 3t^3\sin t$

E. $9t^2\cos t + 9t^2\sin t$

4. $\frac{d}{dx}\left(\frac{3x^3}{\tan x}\right) = \frac{(\tan x)(9x^2) - 3x^3(\sec^2 x)}{(\tan x)^2}$ (hi, lo)

quotient rule: $\frac{\text{lo d hi} - \text{hi d lo}}{\text{lo}^2}$

$= \frac{9x^2\tan x - 3x^3\sec^2 x}{\tan^2 x}$

$= \frac{3x^2(3\tan x - x\sec^2 x)}{\tan^2 x}$

A. $\frac{3x^2(3\tan x + x\sec^2 x)}{\tan^2 x}$

B. $\frac{9x^2}{\sec^2 x}$

C. $\frac{3x^2(3\tan x + x\sec^2 x)}{\sec^2 x}$

D. $\frac{3x^2(3\tan x - x\sec^2 x)}{\sec^2 x}$

E. $\frac{3x^2(3\tan x - x\sec^2 x)}{\tan^2 x}$