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11) $s = 4\sin 4t$

a) $s'(t) = v(t) = 4\cos 4t\,(4) = 16\cos 4t$

$v(t) = 0$

$\rightarrow 16\cos 4t = 0$

$\rightarrow \cos 4t = 0$

$\rightarrow 4t = \frac{\pi}{2}, \frac{3\pi}{2}, \ldots$

$\rightarrow 4t = \frac{(2n+1)\pi}{2}$

$\rightarrow t = \frac{(2n+1)\pi}{8} \quad (n \in Z)$

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2) b) $f(x) = 6\tan x - \tan 2x$, $x = 0$

$\Rightarrow f'(x) = 6\sec^2 x - 2\sec^2 2x$

$f'(0) = 6\dfrac{1}{\cos^2 0} - 2\dfrac{1}{\cos^2 2.0} = 6(1) - 2(1) = 4$

$f(0) = 6\tan 0 - \tan 2.0 = 0 \Rightarrow$ point $(0,0)$

We have $y = 4x + b \Rightarrow b = 0 \Rightarrow$ equation: $y = 4x$

11) $f(x) = \cot 4x$ 11 page 260

$\rightarrow f'(x) = -4 \csc^2 4x = \frac{-4}{\sin^2 4x}$

$\Rightarrow f''(x) = -\left(\frac{-4 \cdot 2 \sin 4x \cos 4x \cdot 4}{\sin^4 4x}\right)$

$= \frac{32 \cos 4x}{\sin^3 4x}$

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f) $h(u) = e^{\sqrt{u}} \ln\sqrt{u}$

$\rightarrow h'(u) = \frac{e^{\sqrt{u}}}{2\sqrt{u}} \ln\sqrt{u} + \frac{e^{\sqrt{u}}}{2\sqrt{u}\cdot\sqrt{u}}$

$= \frac{e^{\sqrt{u}} \ln\sqrt{u}}{2\sqrt{u}} + \frac{e^{\sqrt{u}}}{2u} = \frac{e^{\sqrt{u}}}{2}\left(\frac{\ln\sqrt{u}}{\sqrt{u}} + \frac{1}{u}\right)$