AP Calculus Trig. Derivatives Name_____

1-8: Differentiate D(1) Day 5

1. $y = 3x^2 - 2\cos x$

2. $y = 2\sec x - \csc x$

3. $f(x) = \sin x + \frac{1}{2}\cot x$

4. $g(\theta) = e^{\theta}(\tan\theta - \theta)$

5. $f(x) = \sqrt{x}\sin x$

6. $y = \sec\theta\tan\theta$

7. $f(t) = \frac{\cot t}{e^t}$

8. $y = \frac{\cos x}{1-\sin x}$

Find an equation of the tangent line to the curve at the given point.

9. $y = \sec x \quad \left(\frac{\pi}{3}, 2\right)$

10. $y = e^x\cos x \quad (0,1)$

11. If $H(\theta)=\theta\sin\theta$, find $H'(\theta)$ and $H''(\theta)$.

12. Suppose $f\left(\frac{\pi}{3}\right)=4$ and $f'\left(\frac{\pi}{3}\right)=-2$ and let $g(x)=f(x)\sin x$ and $h(x)=\frac{\cos x}{f(x)}$. Find

A.) $g'\left(\frac{\pi}{3}\right)=$

B.) $h'\left(\frac{\pi}{3}\right)=$

13-14 For what values of x does the graph of f have a horizontal tangent?

13. $f(x)=x+2\sin x$

14. $f(x)=e^x\cos x$

15. $\frac{d^{99}}{dx^{99}}(\sin x)$

Answers:

1. $y'(x)=6x+2\sin x$
2. $y'(x)=2\sec x\tan x+\csc x\cot x$
3. $f'(x)=\cos x-\frac{1}{2}\csc^2 x$
4. $g'(\theta)=e^{\theta}\left(\sec^2\theta-1+\tan\theta-\theta\right)$
5. $f'(x)=\sqrt{x}\cos x+\frac{\sin x}{2\sqrt{x}}$
6. $y'(\theta)=\sec\theta\left(\sec^2\theta+\tan^2\theta\right)$
7. $f'(t)=\frac{-\csc^2 t-\cot t}{e^t}$
8. $y'(x)=\frac{1}{1-\sin x}$
9. $y-2=2\sqrt{3}\left(x-\frac{\pi}{3}\right)$
10. $y-1=1(x-0)$ or $y=x+1$
11. $H'(\theta)=\theta\cos\theta+\sin\theta$ & $H''(\theta)=-\theta\sin\theta+2\cos\theta$
12.a $g'\left(\frac{\pi}{3}\right)=2-\sqrt{3}$ 12.b $h'\left(\frac{\pi}{3}\right)=\frac{1-2\sqrt{3}}{16}$
13. $x=\frac{2\pi}{3}$
14. $x=\frac{\pi}{4}$
15. $\frac{d^{99}}{dx^{99}}=-\cos x$