AP Calculus Name___________________Pd.___

Chain Rule D(1) Day 6

1-3: Write the composite function in the form f(g(x)). [Identify the inner function u=g(x) and the outer function y=f(u).] Then find the derivative dy/dx.

1. $y=\left(2x^3+5\right)^4$	2. $y=\sin(\cot x)$	3. $y=e^{\sqrt{x}}$

4-11 Find the derivative of each function

4. $F(x)=(4x-x^2)^{100}$	5. $f(t)=\sin(e^t)+e^{\sin t}$
6. $f(x)=(2x-3)^4(x^2+x+1)^5$	7. $y=\left(\dfrac{x^2+1}{x^2-1}\right)^3$

8. $f(s)=\sqrt{\dfrac{s^2+1}{s^2+4}}$

9. $F(t)=e^{t\sin t}$

10. $y=\sec^2(m\theta)$ $\quad m = constant$

11. $f(x)=(3x+7)^{10}$

Find y’ and y”. **OPTIONAL**

12. $y=e^{\alpha x}\sin(\beta x)$ $\quad \alpha$ and β are contstants

Answers:

1. $y'(x)=24x^2(2x^3+5)^3$
2. $y'(x)=-\cos(\cot x)\csc^2 x$
3. $y'(x)=\dfrac{e^{\sqrt{x}}}{2\sqrt{x}}$
4. $F'(x)=200(2-x)(4x-x^2)^{99}$
5. $f'(t)=e^t\cos(e^t)+e^{\sin t}\cos t$
6. $f'(x)=(x^2+x+1)^4(2x-3)^3(28x^2-12x-7)$
7. $y'(x)=\dfrac{-12x(x^2+1)^2}{(x^2-1)^4}$
8. $f'(s)=\dfrac{3s}{(s^2+1)^{\frac{1}{2}}(s^2+4)^{\frac{3}{2}}}$
9. $F'(t)=e^{t\sin t}(t\cos t+\sin t)$
10. $y'(\theta)=2m\sec^2(m\theta)\tan(m\theta)$
11. $f'(x)=30(3x+7)^9$
12. $y'(x)=e^{\alpha x}(\beta\cos(\beta x)+\alpha\sin(\beta x))$ & $y''(x)=e^{\alpha x}(-\beta^2\sin(\beta x)+\alpha\beta\cos(\beta x)+\alpha\sin(\beta x))$