Calculus AB　　　　Memorize This Quiz　　　　Name________________

Find the derivative of each quantity.
Note that u and v are functions of x (i.e. u(x), v(x))

1) $\frac{d}{dx}(\sin u) = \cos u \; u'$

2) $\frac{d}{dx}(\sec u) = \sec u \tan u \; u'$

3) $\frac{d}{dx}(\ln|u|) = \frac{1}{u} \cdot u'$

4) $\frac{d}{dx}(\cos u) = -\sin u \cdot u'$

5) $\frac{d}{dx}(\tan^{-1} u) = \frac{1}{1+u^2} \; u'$

6) $\frac{d}{dx}(\csc u) = -\csc u \cot u \; u'$

7) $\frac{d}{dx}(\sin^{-1} u) = \frac{1}{\sqrt{1-u^2}} \; u'$

8) $\frac{d}{dx}(\cot u) = -\csc^2 u \; u'$

9) $\frac{d}{dx}(e^u) = e^u \; u'$

10) $\frac{d}{dx}(\sec^{-1} u) = \frac{1}{|u|\left(\sqrt{u^2-1}\right)} \; u'$

11) $\frac{d}{dx}(\tan u) = \sec^2 u \; u'$

12) $\frac{d}{dx}(a) = 0$
where a = constant

13) $\frac{d}{dx}(\cos^{-1} u) = -\frac{1}{\sqrt{1-u^2}} \; u'$

14) $\frac{d}{dx}(uv) = u'v + uv'$

15) $\frac{d}{dx}(u+v) = u' + v'$

16) $\frac{d}{dx}\left(\frac{u}{v}\right) = \frac{u'v - uv'}{v^2}$

17) $\frac{d}{dx}(f(g(x))) = f'(g(x)) \cdot g'(x)$

18) $\frac{d}{dx}(u^n) = n u^{n-1} \cdot \frac{du}{dx}$
where n is an integer

19) $\frac{d}{dx}(a^u) = a^u \ln a \cdot u'$

20) $\frac{d}{dx}(\log_a |u|) = \frac{1}{u \cdot \ln a} \; u'$

$\log_a |u| = \frac{\ln|u|}{\ln a}$

Integrate as indicated. Note that a is a positive real number.

21) $\int \cos(u)\,du = \sin u + C$

22) $\int \frac{1}{u}\,du = \ln|u| + C$

23) $\int \sec(u)\,du = \ln|\sec u + \tan u| + C$

24) $\int \sin(u)\,du = -\cos u + C$

25) $\int e^u\,du = e^u + C$

26) $\int \sec^2 u\,du = \tan u + C$

27) $\int a^u\,du = \frac{a^u}{\ln a} + C$

28) $\int \csc^2 u\,du = -\cot u + C$

29) $\int \sec u \tan u\,du = \sec u + C$

30) $\int \tan u\,du = \ln|\sec u| + C$

31) $\int \csc u\,du = -\ln|\csc u + \cot u| + C$

32) $\int \frac{1}{\sqrt{1-u^2}}\,du = \sin^{-1} u + C$

33) $\int \frac{1}{1+u^2}\,du = \tan^{-1} u + C$

34) $\int \csc u \cot u\,du = -\csc u + C$

35) $\int \frac{1}{u\sqrt{u^2-1}}\,du = \sec^{-1} u + C$

36) $\int \cot u\,du = -\ln|\csc u| + C$