AP Calculus AB | Activity 33 - Math Facts | Name:
Dr. Paul L. Bailey | Tuesday, March 17, 2020

Let a, b, c, d be fixed (constant) real numbers. Let u, v, and y be functions of x.

(1) $\frac{d}{dx}(au + bv) =$ _____ (linearity)

(2) $\frac{d}{dx}(uv) =$ _____ (product rule)

(3) $\frac{d}{dx}\left(\frac{u}{v}\right) =$ _____ (quotient rule)

(4) $\frac{d}{dx}y(u) =$ _____ (chain rule)

(5) $\frac{d}{dx}u^a =$ _____ $\cdot \frac{du}{dx}$

(6) $\frac{d}{dx}a^u =$ _____ $\cdot \frac{du}{dx}$, where $a > 0$

(7) $\frac{d}{dx}e^u =$ _____ $\cdot \frac{du}{dx}$

(8) $\frac{d}{dx}\ln(u) =$ _____ $\cdot \frac{du}{dx}$

(9) $\frac{d}{dx}\sin(u) =$ _____ $\cdot \frac{du}{dx}$

(10) $\frac{d}{dx}\cos(u) =$ _____ $\cdot \frac{du}{dx}$

(11) $\frac{d}{dx}\tan(u) =$ _____ $\cdot \frac{du}{dx}$

(12) $\frac{d}{dx}\sec(u) =$ _____ $\cdot \frac{du}{dx}$

(13) $\frac{d}{dx}\arcsin(u) =$ _____ $\cdot \frac{du}{dx}$

(15) $\frac{d}{dx}\arctan(u) =$ _____ $\cdot \frac{du}{dx}$

(16) $\frac{d}{dx}\operatorname{arcsec}(u) =$ _____ $\cdot \frac{du}{dx}$

(17) $\int u^a \, du =$ _____ $+ C$, where $a \neq -1$

(18) $\int u^a \, du =$ _____ $+ C$, where $a = -1$

(19) $\int a^u \, du =$ _____ $+ C$, where $a > 0$

(20) $\int e^u \, du =$ _____ $+ C$

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

(22) $\int \cos(u) \, du =$ _____ $+ C$

(23) $\int \tan(u) \, du =$ _____ $+ C$

(24) $\int \sec^2(u) \, du =$ _____ $+ C$

(25) $\int \csc^2(u) \, du =$ _____ $+ C$

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

(27) $\int \sin^2(u) \, du =$ _____ $+ C$

(28) $\int \cos^2(u) \, du =$ _____ $+ C$

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

(30) $\int \dfrac{1}{\sqrt{1-u^2}} \, du =$ _____ $+ C$

(31) $\int \dfrac{1}{1+u^2} \, du =$ _____ $+ C$

(32) $\int \dfrac{1}{|u|\sqrt{u^2-1}} \, du =$ _____ $+ C$