WHAT IS HAPPENING IN THE CALCULUS PROBLEM TO THE RIGHT?

$$\ln(x^2+1) + \tan^{-1}(x) + k$$

$$\ln|u| + \int \frac{dx}{x^2+1}$$

$$\int \frac{du}{u} + \int \frac{dx}{x^2+1}$$

$$\int \frac{2x\,dx}{x^2+1} + \int \frac{dx}{x^2+1}$$

$$\int \frac{2x+1}{x^2+1}\,dx$$

Inverse Trig Integrals

$$\int \frac{1}{\sqrt{1-x^2}}dx = \sin^{-1}(x) + k \qquad \int \frac{1}{x^2+1}dx = \tan^{-1}(x) + k$$

Match each indefinite integral with an anti-derivative.

1) $\int \frac{2}{x^2+1}dx$	2) $\int \frac{2}{\sqrt{1-4x^2}}dx$	3) $\int \frac{1}{9x^2+9}dx$	4) $\int \frac{3}{9x^2+1}dx$
5) $\int \frac{1}{\sqrt{1-25x^2}}dx$	6) $\int \frac{1}{\sqrt{4-4x^2}}dx$	7) $\int \frac{8x}{\sqrt{1-4x^2}}dx$	8) $\int \frac{2x}{x^2+1}dx$
9) $\int \frac{1}{\sqrt{25-x^2}}dx$	10) $\int \frac{3}{x^2+9}dx$	11) $\int \frac{1}{\sqrt{25-4x^2}}dx$	12) $\int \frac{1}{4x^2+9}dx$

Indefinite Integrals.

A. $\sin^{-1}(2x) + k$	B. $\tan^{-1}(2x) + k$	D. $2\tan^{-1}(x) + k$	E. $\tan^{-1}(3x) + k$
F. $\frac{1}{3}\tan^{-1}(x) + k$	G. $\frac{1}{9}\tan^{-1}(x) + k$	I. $\frac{1}{2}\sin^{-1}(\frac{2x}{5}) + k$	I. $\tan^{-1}(\frac{x}{3}) + k$
K. $\frac{1}{5}\sin^{-1}(x) + k$	N. $\sin^{-1}(\frac{x}{5}) + k$	O. $\frac{1}{6}\tan^{-1}(\frac{2x}{3}) + k$	R. $\frac{1}{2}\sin^{-1}(x) + k$
S. $\ln\|x^2+1\| + k$	T. $-2\sqrt{1-4x^2} + k$	T. $\frac{1}{5}\sin^{-1}(5x) + k$	Z. $\frac{1}{x^2+1} + k$

1	11	8	11	9	7	4	3	6	2	5	10	12	9