38

$$\int_1^2 \frac{1}{u\sqrt{u^2-1}}\,du$$

$$\lim_{b\to 1^+} \int_b^2 \frac{\cancel{1}}{u\cancel{\sqrt{u^2-1}}}\,\cancel{du}$$

$$w = \sqrt{u^2-1}$$

$$dw = \cancel{\tfrac{1}{2}}(u^2-1)^{-\frac{1}{2}} \cdot \cancel{2}u\,du$$

$$dw = \frac{u}{\sqrt{u^2-1}}\,du$$

$$\frac{dw}{u} = \frac{1}{\sqrt{u^2-1}}\,du$$

37

$$\int_0^\infty \frac{1}{(1+s)\sqrt{s}}\,ds$$

$$u^2 = s$$

$$u = \sqrt{s}$$

$$du = \frac{1}{2\sqrt{s}}\,ds$$

$$2du = \frac{1}{\sqrt{s}}\,ds$$

$$2\int_0^\infty \frac{1}{u^2+1}\,du$$

$$\lim_{b\to\infty} 2\int_0^b \frac{1}{u^2+1}\,du$$

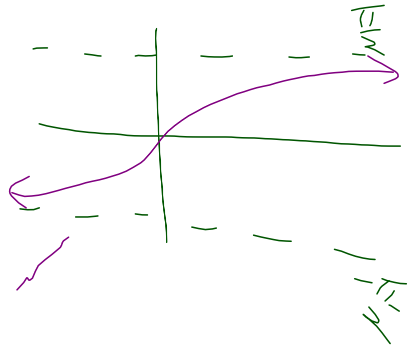
$$\lim_{b\to\infty} 2\Big[\tan^{-1} u\Big]_{s=0}^{s=b}$$

$$\lim_{b\to\infty} 2\Big[\tan^{-1}\sqrt{s}\Big]_{s=0}^{s=b}$$

$$\lim_{b\to\infty} 2\Big[\tan^{-1}\sqrt{b} - \tan^{-1}(0)\Big]$$

$$\lim_{b\to\infty} 2\Big[\frac{\pi}{2} - 0\Big]$$

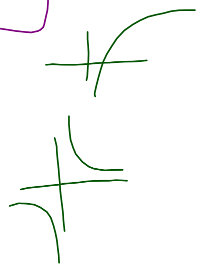
$$\pi$$



$$f(x) = (\tan x)^x$$

$$\ln f(x) = \boxed{x \ln(\tan x)}$$

$$\frac{\ln(\tan x)}{\frac{1}{x}} \rightarrow$$



$$\ln f(x) = ?$$

$$\begin{cases} x-9 & x \geq 9 \\ 9-x & x < 9 \quad -(x-9) \end{cases}$$

$$\lim_{b \to 9^-} \int_0^{b} \frac{1}{\sqrt{9-x}} + \lim_{x \to 9^+} \int_9^{25} \frac{1}{\sqrt{x-9}}$$

$5 - 7$

$$\frac{6+\cos x}{\sqrt{x}}$$

$$\frac{5}{\sqrt{x}} \le \frac{6+\cos x}{\sqrt{x}} \le \frac{7}{\sqrt{x}}$$

$$\frac{6+\cos x}{\sqrt{x}} > \boxed{\frac{1}{\sqrt{x}}}$$

$$\lim_{b\to\infty}\int_1^b \frac{1}{\sqrt{x}}\,dx$$

$g_2 = -\frac{1}{4}$ $g_5 = 16$

$\_\_\_ \quad \underline{-\frac{1}{4}} \quad \_\_\_ \quad \_\_\_ \quad \underline{16}$

$g_n = g_1 \cdot r^{n-1}$

$-\frac{1}{4} = g_1 \cdot r^{2-1}$

$16 = g_1 \cdot r^{5-1}$

$x^3 \quad e^x \quad 3^x \quad (\ln 3)^x$

$x^3, \ (\ln 3)^x, \ e^x, \ 3^x$

$$\lim_{x \to \infty} \frac{3^x + 7^x}{3^x}$$

$$\frac{3^x}{3^x} + \frac{7^x}{3^x}$$

$$1 + \left(\frac{7}{3}\right)^x$$