

$$\frac{\sec^2 x}{2}$$

$$\left[\frac{\sec x + \cos x}{x^3 - 3x + 1} - 1 \right]$$

$$\frac{\sec x + \cos x}{x^3 - 3x + 1} - 1$$

$$\frac{\cos x - x^3 + 3x - 1}{x^3 - 3x + 1} \log \left[1 + \frac{\sec x + \cos x}{x^3 - 3x + 1} - 1 \right]$$

$$\frac{\frac{2x-1}{x} - x^2 + 3}{x^3 - 3x + 1} \log \left[1 + \frac{\sec x + \cos x}{x^3 - 3x + 1} - 1 \right]$$

$$= \lim_{x \rightarrow 1} e^{\frac{\log 3 + 0}{4} \cdot \frac{4}{1} \cdot 1} = e^{\log 3} = 3$$

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$$\lim_{x \rightarrow 1} \left(\frac{2x+5}{x-1 + \sec^2(x-1)} \right)^{\pi - 4 \arctan x}$$

$$= \lim_{x \rightarrow 1} e^{(\pi - 4 \arctan x) \log \frac{2x+5}{x-1 + \sec^2(x-1)}}$$

$$= \lim_{x \rightarrow 1} e^{\frac{\pi - 4 \arctan x}{2x+5} \cdot \frac{2x+5}{x-1 + \sec^2(x-1)} \log \frac{2x+5}{x-1 + \sec^2(x-1)}}$$

$$= \lim_{x \rightarrow 1} e^{\frac{\pi - 4 \arctan x}{2x+5} \cdot (x-1) + \sec^2(x-1)} \cdot \frac{2x+5}{x-1 + \sec^2(x-1)} \log \frac{2x+5}{(x-1) + \sec^2(x-1)}}$$

$$= e^{\frac{0}{7} \cdot 0 \cdot 0} = e^0 = 1$$

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